County of Loudoun

Office of Transportation Services

MEMORANDUM

DATE: March 1, 2010

TO: Jane McCarter, AICP, Project Manager
Department of Planning

FROM: Lou Mosurak, AICP, Senior Coordinator LM

SUBJECT: **SPEX 2009-0008—Corpus Christi Parish**
SPEX 2009-0012—Corpus Christi Parish School
SPEX 2009-0013—Corpus Christi Parish Convent
Second Referral

Background

This referral serves as an update to the status of issues identified in the first Office of Transportation Services (OTS) referral (dated July 6, 2009) on the subject special exception (SPEX) applications. The applications request approval to construct a 1,200-seat religious assembly building (church/parish) and related uses, a 200-student private school (grades K-8), and a 10-resident group living facility (convent/rectory)[1]. The site is proposed to be developed in two phases, with the initial phase (Phase 1, 2012) consisting of a 335-seat church (a reduction from the previous submittal), and the subsequent phase (Phase 2, 2015) consisting of the balance of the proposed 1,200-seat church along with the school and convent/rectory.

The 17.9-acre site is zoned Transitional Residential-1 (TR-1) and is located on the east side of future Marrwood Drive, south of John Mosby Highway (U.S. Route 50) and west of future Northstar Boulevard (Route 659 Relocated). A vicinity map is provided as ***Attachment 1***, and a more detailed location map of the site is provided as ***Attachment 2***. Access is proposed from U.S. Route 50 via Goshen Road (Route 616) and future Marrwood Drive. In the future (in conjunction with development of the approved Westport subdivision), Goshen Road is anticipated to be realigned (and its former alignment abandoned) between the site and U.S. Route 50, which would result in long-term access to the site from Route 50 via future Westport Boulevard and Marrwood Drive.

This review is based on materials received by OTS from the Department of Planning on December 23, 2009, including (1) a letter responding to initial referral comments, prepared by Bowman Consulting Group, Ltd., dated November 18, 2009; (2) a revised statement of justification prepared by Bowman Consulting Group, Ltd., revised though November 18,

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[1] An additional special exception, SPEX 2009-0014 – Corpus Christi Parish Public Road Access, was initially filed as well. Zoning Administration has determined that application to be unnecessary and therefore it has been withdrawn by the Applicant.

2009; (3) a revised traffic impact study (including responses to the first OTS referral) prepared by Wells & Associates, Inc., revised through October 26, 2009 (received by OTS on January 5, 2010); and (4) a revised special exception plat (plan set) prepared by Bowman Consulting Group, Ltd., revised through October 22, 2009.

Review of Applicant's Revised Traffic Study

The Applicant's most recent traffic study (dated October 26, 2009) replaces the previous (February 24, 2009) traffic study and reflects the revised phasing plan currently proposed for the site: Phase 1 development (assumed to be completed in 2012) includes a 335-seat church; Phase 2 development (assumed to be completed in 2015) adds an additional 865 seats to the church (1,200 seats total), a 200-student private school, and a convent/rectory (maximum occupancy of 10 persons).

The study analyzed current and future traffic conditions in the area. The church and convent/rectory uses were analyzed in light of their peak hour traffic impacts on Sundays, as well as during weekday AM and PM peak hours, while the school use was analyzed in light of its weekday AM and PM peak hour traffic impacts (the school is not proposed to be open on Sundays). Existing lane use and traffic control is illustrated on ***Attachment 3***. Relevant portions of the study are summarized below. The study assumes that a revised access configuration to the site from Route 50 (via future Westport Boulevard and Marrwood Drive, to include signalization and related intersection improvements to the Route 50/Westport Boulevard intersection) will be in place by 2015. The study notes that the Phase 2 uses on the site would not be occupied prior to implementation of these improvements.

Sunday Analysis – Proposed Church and Convent/Rectory Uses

Existing (2008) Traffic Volumes and Levels of Service (LOS)

Attachment 4 illustrates existing Sunday peak hour traffic volumes in the vicinity of the subject site. Sunday peak hour (12:30 – 1:30 PM) traffic counts were taken at five (5) existing intersections. Given that only Sunday peak hour counts were collected, overall Sunday traffic volumes were not able to be calculated from this data and therefore are not included in the report.

Attachments 5 & 6 summarize existing Sunday peak hour intersection LOS in the vicinity of the site. All movements at the signalized intersections and all turning movements at the unsignalized intersections operate at acceptable LOS.

Background Traffic Assumptions

The Applicant's traffic study indicates that regional background traffic will continue to increase due to (1) a total of 20 approved developments in the vicinity of the site, and (2) regional traffic growth (assumed at 2% annually between 2008 and 2015).

Trip Generation from Proposed Church and Convent/Rectory Uses

Attachment 7 lists the trip generation for each proposed use by phase and provides a trip generation comparison with the by-right uses allowed on the site. In Phase 1 (2012), the study indicates that the proposed 335-seat (16,200-sq ft) church (ITE Code 560) would

generate a total of 513 average daily trips (ADT) on Sunday, including 216 trips (112 in and 104 out) during the 12:30 – 1:30 PM peak hour. In Phase 2 (2015), the proposed 1,200-seat (58,000-sq ft) church (ITE Code 560) would generate a total of 1,836 ADT on Sunday, including 744 trips (387 in and 357 out) during the 12:30 – 1:30 PM peak hour. The proposed convent/rectory (assumed to be equivalent to one (1) single family detached dwelling (ITE Code 210)) would add nine (9) additional Sunday vehicle trips, for a total Sunday ADT of 1,845.

When compared to the by-right use currently permitted on the site (19 single family dwellings, ITE Code 210), the proposed Phase 1 (2012) development program (335-seat church) would generate an additional 355 ADTs on Sunday, including 195 additional peak hour trips (101 in and 94 out) during the 12:30 – 1:30 PM peak hour. The proposed Phase 2 (2015) development program (1,200-seat church and convent/rectory) would generate an additional 1,687 ADTs on Sunday, including 723 additional peak hour trips (376 in and 346 out) during the 12:30 – 1:30 PM peak hour.

Trip Distribution and Assignment from Proposed Church and Convent/Rectory Uses

The study distributed Sunday peak hour site-generated trips on the existing and future road network based on information related to the service area of the church and congregation. Sixty-five percent (65%) of site-generated traffic is estimated to arrive from/depart toward the east via Route 50. Complete trip distribution and assignment figures for site-generated trips in Phase 1 (2012) are illustrated on ***Attachment 8***; updated trip assignment figures for Phase 2 (2015), to reflect the assumed changes to the road network, are provided on ***Attachment 9***. The overall distribution of trips does not change with the implementation of the revised road network assumed by the study.

Forecasted (2012 & 2015) Traffic Volumes, Levels of Service (LOS) and Recommended Mitigation Measures for Proposed Church and Convent/Rectory Uses

Attachments 10 & 11 illustrate the study's total future (i.e., background traffic plus site-generated traffic) Sunday peak hour traffic forecasts for 2012 and 2015 (the 2015 forecasts incorporate the revised road network assumed in the study).

Attachments 12 (total future columns), 13 & 14 summarize the total future forecasted Sunday peak hour intersection LOS for both 2012 and 2015. The total future lane use and traffic control necessary to achieve the Sunday peak hour LOS categories identified in ***Attachments 12, 13, & 14*** are depicted in ***Attachments 15 (2012) & 16 (2015)*** respectively.

For Phase 1 (2012) development, only the construction of Marrwood Drive from the southern entrance to The Boyd School (Intersection 7) to the location of the southern entrance to the church site (Intersection 9) and realignment of intersection/southern entrance to the Boyd School are assumed to be in place (constructed by others); otherwise there would be no changes to the existing road network between the site and Route 50 (i.e., stop sign control would remain in place at the Route 50/Goshen Road/Fleetwood Road intersection (Intersection 1)). The study indicates that this network will operate at acceptable LOS during the Sunday peak hour with the proposed Phase 1 development (335-seat church), with the exception of the southbound Fleetwood Road approach at Route 50, which would operate at

LOS E. The study notes that relatively low traffic volumes (approximately 30 vehicles) would utilize this approach, and queuing would be minimal (one to two vehicles); therefore, no improvements are recommended.

By 2015, the study assumes that road improvements constructed by others will be in place, including (1) signalization and turn lane improvements at the Route 50/Westport Boulevard intersection (Intersection 1); (2) construction of Westport Boulevard from Route 50 south into the Westport site; and (3) construction of a realigned segment of Goshen Road (renamed as Marrwood Drive) from Westport Boulevard (Intersection 6) to the southern entrance to the Boyd School (Intersection 7). With the assumed improvements in place, the Route 50/Westport Boulevard intersection (Intersection 1) and all other intersections in the study area operate at acceptable LOS (LOS D or better) during the Sunday peak hour, with the exception of the eastbound side street movement (LOS F) at Goshen Ridge Place and Marrwood Drive (Intersection 8) opposite the northern entrance to the church site.

Although not assumed to be in place by the time of site buildout in 2015, the study notes that a future extension of Marrwood Drive east to Northstar Boulevard (Route 659 Relocated) is contemplated in the future, and that such a connection would provide a second ingress/egress to the proposed church site. This would ultimately result in a lower percentage of site traffic accessing the church via Route 50 and Westport Boulevard.

Weekday Analysis – Proposed Church, School and Convent/Rectory Uses

Existing (2008) Traffic Volumes and Levels of Service (LOS)

Attachment 17 illustrates existing weekday AM and PM peak hour traffic volumes, intersection LOS, and lane use and traffic control at two (2) existing intersections in the vicinity of the site.

Attachment 18 (existing column) summarizes existing weekday peak hour LOS at both of the analyzed intersections. All movements operate at acceptable LOS during weekday peak hours under existing traffic controls.

Background Traffic Assumptions

The Applicant's traffic study assumes a 2% annual growth rate; this was applied to regional traffic on Route 50, and was also used on all turning movements at the Route 50/Goshen Road intersection and on all through movements on Goshen Road. The study states that this rate was determined based on previously-prepared studies in the area. In addition, background traffic from 20 approved developments in the vicinity of the site has also been incorporated into the study.

Trip Generation from Proposed Church, School and Convent/Rectory Uses

Attachment 19 lists the trip generation for each proposed use by phase and provides a trip generation comparison with the by-right uses allowed on the site. In Phase 1 (2012), the study indicates that the proposed 335-seat (16,200-sq ft) church (ITE Code 560) would generate a total of 148 average daily trips (ADT) on a weekday, including 12 AM peak hour trips (6 in and 6 out) and 11 PM peak hour trips (6 in and 5 out). In Phase 2 (2015), the

proposed development program (i.e., 1,200-seat (58,000-sq ft) church (ITE Code 560), 200-student (K-8) private school (ITE Code 534), and convent/rectory (equivalent to one (1) single-family detached dwelling (ITE Code 210)) would generate a total of 1,024 average weekday daily trips (ADT), including 218 AM peak hour trips (120 in and 98 out) and 168 PM peak hour trips (81 in and 87 out). School buses were not assumed to serve the school.

When compared to the by-right use currently permitted on the site (19 single family dwellings, ITE Code 210), the proposed Phase 1 (2012) development program (335-seat church) would generate 42 fewer weekday ADTs, including 15 fewer AM peak hour trips (-1 in and -14 out) and 14 fewer PM peak hour trips (-10 in and -4 out). The proposed Phase 2 (2015) development program (1,200-seat church, 200-student school and convent/rectory) would generate an additional 834 weekday ADTs, including 191 additional AM peak hour trips (113 in and 78 out) and an additional 143 PM peak hour trips (65 in and 78 out).

Trip Distribution and Assignment from Proposed Church, School and Convent/Rectory Uses

The study distributed the site-generated weekday AM and PM peak hour trips on the existing and future road network based on information related to the service area of the church, school and knowledge of the area. Seventy-five percent (75%) of church-generated traffic is estimated to arrive from/depart toward the east via Route 50 in both Phase 1 (2012) and Phase 2 (2015), as is 40% of school-generated traffic in Phase 2 (2015). Complete trip distribution and assignment figures for site-generated trips in Phase 1 (2012) and Phase 2 (2015) are illustrated on ***Attachment 20***.

Forecasted (2012 & 2015) Traffic Volumes, Levels of Service (LOS) and Recommended Mitigation Measures for Church, School and Convent/Rectory Uses

Attachment 21 illustrates the study's total future (i.e., background traffic plus site-generated traffic) weekday peak hour traffic forecasts for 2012 and 2015 (the 2015 forecasts incorporate the revised road network assumed in the study).

Attachments 18 (total future columns)& 22 summarize the total future forecasted weekday peak hour intersection LOS for both 2012 and 2015. The total future lane use and traffic control assumed to be in place to achieve the weekday peak hour LOS categories identified in ***Attachments 18 & 22*** are depicted in ***Attachment 23*** (these improvements are identical to those assumed for the Sunday analysis in ***Attachments 15 (2012) & 16 (2015))***.

As in the Sunday analysis discussed above, only the construction of Marrwood Drive from the southern entrance to The Boyd School (Intersection 2) to the location of the southern entrance to the church site (Intersection 4) and realignment of intersection/southern entrance to the Boyd School are assumed to be in place (constructed by others) for Phase 1 (2012) development; otherwise there would be no changes to the existing road network between the site and Route 50 (i.e., stop sign control would remain in place at the Route 50/Goshen Road/Fleetwood Road intersection (Intersection 1)). As a result, both the north and south side street movements (Goshen Road and Fleetwood Road) at this location (Intersection 1) are forecast to operate at unacceptable LOS (LOS F) during both the weekday AM and PM peak hours under stop sign control. The study indicates that although a signal would restore

an acceptable LOS to this intersection, signalization is not warranted due to relatively low side street volumes. The study notes that the proposed 335-seat church in Phase 1 is forecast to generate only a "minor volume" of weekday peak hour trips (12 AM peak hour trips and 11 PM peak hour trips) and therefore have "little impact" on intersection operations. The study also notes that the proposed Phase 1 church use would generate fewer trips in both the AM and PM peak hour as well as fewer ADTs than the 19 by-right residential units that are currently permitted on the site.

Also as in the Sunday analysis discussed above, the study assumes that road improvements constructed by others will be in place by 2015, which will result in acceptable weekday peak hour LOS at the Route 50/Westport Boulevard intersection (Intersection 1). The study again notes that a future extension of Marrwood Drive east to Northstar Boulevard (Route 659 Relocated) is contemplated in the future (though not assumed by the study), and that such a connection would provide a second ingress/egress to the proposed church/school/convent/rectory uses. This connection would ultimately result in a lower percentage of site traffic accessing the site via Route 50 and Westport Boulevard.

Status of Transportation Issues/Comments

Staff comments from the first OTS referral (July 6, 2009), as well as the Applicant's responses (quoted directly from the responses contained in Appendix A of the October 26, 2009 revised traffic study) and issue status, are provided below.

1. Initial Staff Comment (1st Referral): Regarding the February 24, 2009 traffic study:

    a. Initial Staff Comment (1st Referral): Weekday daily (ADT) trip generation figures should be provided for the church and school uses.

    Applicant's Response (October 26, 2009): The ADTs are provided in the updated traffic study.

    Issue Status: Weekday daily (ADT) trip generation figures are now provided in *Attachment 19*. Issue resolved.

    b. Initial Staff Comment (1st Referral): Further explanation/clarification is necessary regarding the rationale for excluding existing Sunday daily (ADT) volumes from the report. The study (pg. 19) states that calculating these volumes would be "difficult".

    Applicant's Response (October 26, 2009): The accepted method for calculating the Average Daily Traffic (ADT) for weekday conditions applies a 10 percent "k" factor to the two-way, PM peak hour volume. Since existing ADT information for Sundays is not available, it is unknown if 10 percent would be the appropriate k factor for the Sunday ADT calculation. Therefore, these volumes were excluded in the updated traffic report. Further explanation is provided in the updated traffic study.

    Issue Status: The Applicant's explanation is appreciated. Issue resolved.

c. Initial Staff Comment (1st Referral): Further explanation/clarification is necessary regarding the methodology used to factor/convert the weekday PM peak hour for school trips to the weekday PM peak hour for commuter trips. The traffic impact of the school during its PM peak hour should be indicated.

Applicant's Response (October 26, 2009): The ITE Trip Generation Manual does not provide rates for trips generated by a K-8 school during the weekday PM commuter peak hour. Therefore, Wells & Associates derived a rate by comparing similar uses and data collected by W & A, and is indicated in the traffic study for PM peak hour conditions. Further clarification and derivation of this rate is included as an appendix in the updated traffic study.

Issue Status: The table included in Appendix T of the updated traffic study (provided as *Attachment 24)* contains the same information as in the earlier version of the study. OTS requests information on the traffic impact of the school during its PM peak hour (not the PM commuter peak hour) and whether any capacity issues will result. Issue not resolved.

d. Initial Staff Comment (1st Referral): The study (pg. 13) indicates that a traffic signal warrant study is currently under VDOT review for a new signal at the intersection of Route 50 and future Westport Boulevard. OTS is not in receipt of this study and it should be provided for review under separate cover. It is noted that the signal warrant analysis included in the traffic study (Appendix V, provided as *Attachment 24 [in the first OTS referral]*) is a summary table based on Figure 2-10 of the *Manual of Traffic Signal Design* and not a full *Manual of Uniform Traffic Control Devices (MUTCD)* warrant study that is required by VDOT for installation of traffic signals on existing roads.

Applicant's Response (October 26, 2009): Since submission and review of the traffic signal warrant study referenced above could not be verified, this reference has been deleted from the traffic report.

Issue Status: The removal of this reference from the traffic study is appreciated, however, it is noted that a traffic signal warrant study will need to be completed by others and approved by VDOT prior to installation of a signal at this intersection. Issue resolved with respect to this application.

e. Initial Staff Comment (1st Referral): The traffic study assumes that all off-site road improvements between the site and Route 50 will be constructed "by others" as part of the adjacent Westport and Marrwood subdivisions. OTS staff notes that both of these developments have only received preliminary subdivision approvals and therefore it is not assured that these sites will be developed as assumed.

Applicant's Response (October 26, 2009): The phase one improvements assumed the extension of Marrwood Drive to Goshen Ridge Drive to serve the property. The updated traffic study continues to assume that phase two of the project will move forward only after the planned roadway improvements by Westport and others are made.

Issue Status: The Applicant's response is appreciated. OTS recommends that a condition of approval be included limiting development of the site to the proposed Phase 1 (335-seat church) use until such time as the improvements assumed in the study along Marrwood Drive, the realigned segment of Goshen Road, Westport Boulevard, and at the future Westport Boulevard/Route 50 intersection are in place and open to traffic. Issue resolved, pending inclusion of condition language to this effect.

f. Initial Staff Comment (1st Referral): Further explanation/clarification is necessary regarding the methodology used to determine the distribution of site-generated trips, particularly with respect to the differences assumed between Sunday and weekday trips.

Applicant's Response (October 26, 2009): Trip distributions for the church were determined in conjunction with the CDA based on the anticipated parish boundaries. The current boundaries are as follows:

> *Including the Southwestern portion of Loudoun County beginning at New Road (Route 600) and Bull Run, then following along Loudoun County line southeast toward the Fairfax County line. Then, north along Fairfax County line, west along John S. Mosby Highway (U.S. Route 50), southwest on Lenah Road (Route 600), west on New Road (Route 600), returning to the Loudoun County line and Bull Run junction.*

Subsequent to a review of these boundaries, W & A used engineering judgment and knowledge of the area to determine to distributions of church base site generated traffic. The weekday distributions reflect those presented in the approved Arcola (Boyd) School traffic report since they are needed to analyze the AM and PM peak hours.

Issue Status: The Applicant's explanation is appreciated. Issue resolved.

g. Initial Staff Comment (1st Referral): The traffic study references the future extension of Marrwood Drive as connecting with the Stone Ridge development. This is true only as far east as Route 659 Relocated (Northstar Boulevard) as the pending Stone Ridge rezoning application (ZMAP 2006-0011) proposes to relocate the roadway on the east side of Northstar Boulevard (Millstream Drive) to turn south and connect with Tall Cedars Parkway (in order to avoid a major floodplain crossing). The traffic study (and the vicinity map on the cover sheet of the plan set) should be revised to reflect this scenario.

Applicant's Response (October 26, 2009): Acknowledged. The previously prepared and updated traffic study does not assume the future extension of Marrwood Drive to Northstar Boulevard. The text of the report has been modified to reflect and clarify this comment. Plan set revisions will be addressed by the Applicant.

Issue Status: The clarification/revision to the traffic study text regarding this matter is appreciated; however, the plat has not been revised as indicated. Issue not resolved.

2. Initial Staff Comment (1st Referral): OTS recommends that the traffic signal and associated turn lanes at the intersection of Route 50 and Westport Boulevard (Intersection 1) are installed and operational prior to occupancy of the church (the Applicant should be responsible for the traffic signal warrant study referenced in Comment #1d above should the study not be previously completed by others). Such intersection improvements would serve to benefit the safe and orderly operation of the road network, including traffic generated by the church use, and would be more consistent with driver expectations on a four-lane divided roadway such as Route 50 than would the presence of traffic control personnel. Signalization and related road improvements would also allow for consistent traffic control during all church events, including services at times other than on Sundays, which may generate comparable traffic volumes as Sunday services.

   Applicant's Response (October 26, 2009): The Applicant proposes to reduce the phase one (2012) development size of the church from 1,200 seats to 335 seats. This reduction dramatically reduces the impact to the U.S. Route 50/Goshen Road/Fleetwood Road intersection, and can be adequately accommodated by the existing road network. The future phase two development provides for the expansion of the church to 1,200 seats including a parish center and the construction of a 200-student school and convent/rectory by 2015. The buildout of the site will occur subsequent to improvements made by others that include the realignment of the intersection and installation of turn lanes and a new traffic signal. The construction of phase two is also dependent on the financial ability of the parish (CDA) to move forward with the construction.

   Issue Status: As indicated by the Applicant, the reduction of the proposed Phase 1 (2012) development program results in significantly less of a traffic impact on the Route 50/Goshen Road/Fleetwood Road intersection (Intersection 1). However, unacceptable LOS conditions are still forecast to result at this unsignalized intersection during both the Sunday peak hour (LOS E on the southbound Fleetwood Road approach) and the weekday AM and PM peak hours (LOS F on both the northbound Goshen Road approach and southbound Fleetwood Road approach) even with the reduced Phase 1 (2012) development program. The Applicant should propose mitigation measures to maintain acceptable LOS (LOS D or better) at this intersection during all phases of site development. Issue not resolved.

3. Initial Staff Comment (1st Referral): Should it be determined that traffic control personnel be utilized at the intersection of Route 50 and existing Goshen Road (Intersection 1) on an interim basis until ultimate road improvements including a traffic signal are in place, OTS recommends that only sworn law enforcement personnel be utilized to provide such traffic control functions. If this option is pursued, discussions with the Loudoun County Sherriff's Office should be initiated to determine its position on this issue, including the extent/duration to which traffic control functions should be provided.

Applicant's Response (October 26, 2009): The reduction in the phase one (2012) development size of the church from 1,200 seats to 335 seats reduces the impact to the U.S. Route 50/Goshen Road/Fleetwood Road intersection and can be adequately accommodated by the existing road network. Thus, temporary traffic control personnel are no longer suggested or required.

Issue Status: Given the reduction in the proposed Phase 1 (2012) development program, this issue is no longer applicable. Issue resolved.

4. Initial Staff Comment (1st Referral): The Applicant should coordinate with other parties in the area (i.e., the developers of the Westport and Marrwood subdivisions) to effect, to the extent possible, the construction of the ultimate planned road network (i.e., Westport Boulevard and realigned Goshen Road (Marrwood Drive)) between Route 50 and the site prior to the time the church opens for use. Regardless of the scope of implementation of these ultimate improvements, the traffic signal referenced in Comment #2 above (at Intersection 1) should be configured to accommodate the ultimate alignment of the road network (i.e., Westport Boulevard) with minimal modifications.

   Applicant's Response (October 26, 2009): Coordination with other developers in the area is ongoing to insure appropriate configuration and phasing of road improvements. Notwithstanding as indicated above, the Applicant has revised the traffic analysis to determine the level of traffic that can be accommodated by the existing road network. The Applicant is willing to limit phase one development accordingly.

   Issue Status: OTS recommends that a condition of approval be included limiting development of the site to the proposed Phase 1 (335-seat church) use until such time as the improvements assumed in the study are in place and open to traffic. Issue resolved, pending inclusion of condition language to this effect.

5. Initial Staff Comment (1st Referral): The existing construction plan approval for Marrwood Drive (CPAP 2008-0106) extends south to the proposed northern site entrance (opposite future Goshen Ridge Place). Construction of Marrwood Drive to the eastern property line, to include a paved temporary cul-de-sac, is necessary to be in place and open to traffic prior to occupancy of the church uses.

   Applicant's Response (October 26, 2009): See Applicant's response letter.

   Issue Status: The Applicant's November 18, 2009 response letter received by OTS does not address this comment; the Applicant is requested to clarify its position on this issue. OTS staff notes that the revised traffic study does not assume construction of the southern site entrance until Phase 2. Issue not resolved.

6. Initial Staff Comment (1st Referral): A sidewalk along the site frontage should be depicted on the SPEX plat and provided at the time of construction of Marrwood Drive and/or site development. The sidewalk should be consistent with the five (5)-foot sidewalk depicted along the west side of Marrwood Drive in CPAP 2008-0106 as well as the sidewalk/sidewalk reservation area conditioned as part of the approved development for The Boyd School (SPEX 2008-0021/STPL 2008-0051).

Applicant's Response (October 26, 2009): The Applicant has revised the SPEX plat to show the location of the sidewalk along their property frontage. See Applicant's response letter.

Issue Status: The Applicant's November 18, 2009 response letter received by OTS does not address this comment, though the SPEX plat has been revised to depict a sidewalk along the site frontage as far south as the southern site entrance. The Applicant is requested to clarify its position on this issue, specifically the timing of the sidewalk construction and responsibility for sidewalk construction between the southern site entrance and the eastern property line. Issue not resolved.

7. Initial Staff Comment (1st Referral): Marked crosswalks across both site entrances and Marrwood Drive should be provided at the time of construction of Marrwood Drive and/or site development.

   Applicant's Response (October 26, 2009): As requested, the SPEX plat has been revised to show marked crosswalks. See Applicant's response letter.

   Issue Status: The SPEX plat has been revised to depict crosswalks across the site entrances, but not across Marrwood Drive. The Applicant's November 18, 2009 response letter received by OTS does not address to this comment. OTS recommends depiction of these crosswalks on the SPEX plat, along with a note indicating that they will be installed subject to VDOT approval. Alternatively, a condition of approval to this effect should be included. Issue resolved pending incorporation of plat note and/or condition language.

8. Initial Staff Comment (1st Referral): Discussions regarding a fair-share contribution toward the future extension of Marrwood Drive to Northstar Boulevard and/or other transportation improvements are necessary. OTS staff is available to meet with the Applicant regarding this matter.

   Applicant's Response (October 26, 2009): See Applicant's response letter.

   Issue Status: The Applicant's November 18, 2009 response letter received by OTS does not address this comment; the Applicant is requested to clarify its position on this issue. Issue not resolved.

9. Initial Staff Comment (1st Referral): OTS staff requests to be included in any meetings between VDOT and the Applicant regarding these applications.

   Applicant's Response (October 26, 2009): Acknowledged.

   Issue Status: Issue resolved.

New Issue

Since completion of the first referral dated July 6, 2009, OTS staff has identified the following additional issue:

10. The traffic study ***(Attachments 12 & 14)*** indicates that failing LOS conditions (LOS F) will result on the eastbound Goshen Ridge Drive approach opposite the northern site entrance (Intersection 8) during the Sunday peak hour with Phase 2 (2015) of the proposed development program in place. Mitigation measures, such as the use of traffic control personnel, should be identified by the Applicant to maintain acceptable LOS at this intersection.

Conclusion

OTS will offer a recommendation once it has reviewed the Applicant's responses to the comments contained in this referral. Depending on the Applicant's responses, additional transportation comments may be necessary. OTS staff is available to meet with the Applicant to discuss the transportation issues related to this proposal.

ATTACHMENTS

1. Site Vicinity Map
2. Detailed Site Location Map (Traffic Study Figure 2-1)
3. Existing Lane Use & Traffic Control (Traffic Study Figure 2-3)
4. Existing (2008) Traffic Volumes (Sunday) (Traffic Study Figure 3-1)
5. Existing (2008) Intersection LOS Summary (Sunday) (Traffic Study Table 3-1)
6. Existing (2008) Intersection LOS Summary (Sunday) (Traffic Study Figure 3-2)
7. Site Trip Generation Analysis/Comparison (Sunday) (Traffic Study Table 5-1)
8. Site-Generated Trip Distribution/Assignment (2012) (Sunday) (Traffic Study Figure 5-1)
9. Site-Generated Trip Distribution/Assignment (2015) (Sunday) (Traffic Study Figure 5-2)
10. Total Future Peak Hour Traffic Forecasts (2012) (Sunday) (Traffic Study Figure 6-1)
11. Total Future Peak Hour Traffic Forecasts (2015) (Sunday) (Traffic Study Figure 6-2)
12. Total Future Intersection LOS Summary (2012 & 2015) (Sunday) (Traffic Study Table 6-1)
13. Total Future Intersection LOS Summary (2012) (Sunday) (Traffic Study Figure 6-3)
14. Total Future Intersection LOS Summary (2015) (Sunday) (Traffic Study Figure 6-4)
15. Future Lane Use & Traffic Control (2012) (Sunday) (Traffic Study Figure 4-1)
16. Future Lane Use & Traffic Control (2015) (Sunday) (Traffic Study Figure 4-2)
17. Existing (2008) Peak Hour Traffic Volumes, LOS Summary, and Lane Use & Traffic Control (Weekday) (Traffic Study Figure 9-1)
18. Total Future Intersection LOS Summary (Weekday) (2012 & 2015) (Traffic Study Table 9-1)
19. Site Trip Generation Analysis/Comparison (Weekday) (Traffic Study Table 9-2)
20. Site-Generated Trip Distribution/Assignments (2012 & 2015) (Weekday) (Traffic Study Figure 9-7)
21. Total Future Peak Hour Traffic Forecasts (2012 & 2015) (Weekday) (Traffic Study Figure 9-8)
22. Total Future Intersection LOS Summary (2012 & 2015) (Weekday) (Traffic Study Figure 9-9)
23. Future Lane Use & Traffic Control (2012 & 2015) (Weekday) (Traffic Study Figure 9-4)
24. Trip Generation Rate Comparison Table – PM School Peak vs. PM Commuter Peak (Traffic Study Table T-1)

cc: Andrew Beacher, Assistant Director, OTS
Chuck Acker, Traffic Controller/Engineer, OTS
John Bassett, Transportation Engineer, VDOT

VICINITY MAP

ATTACHMENT 1

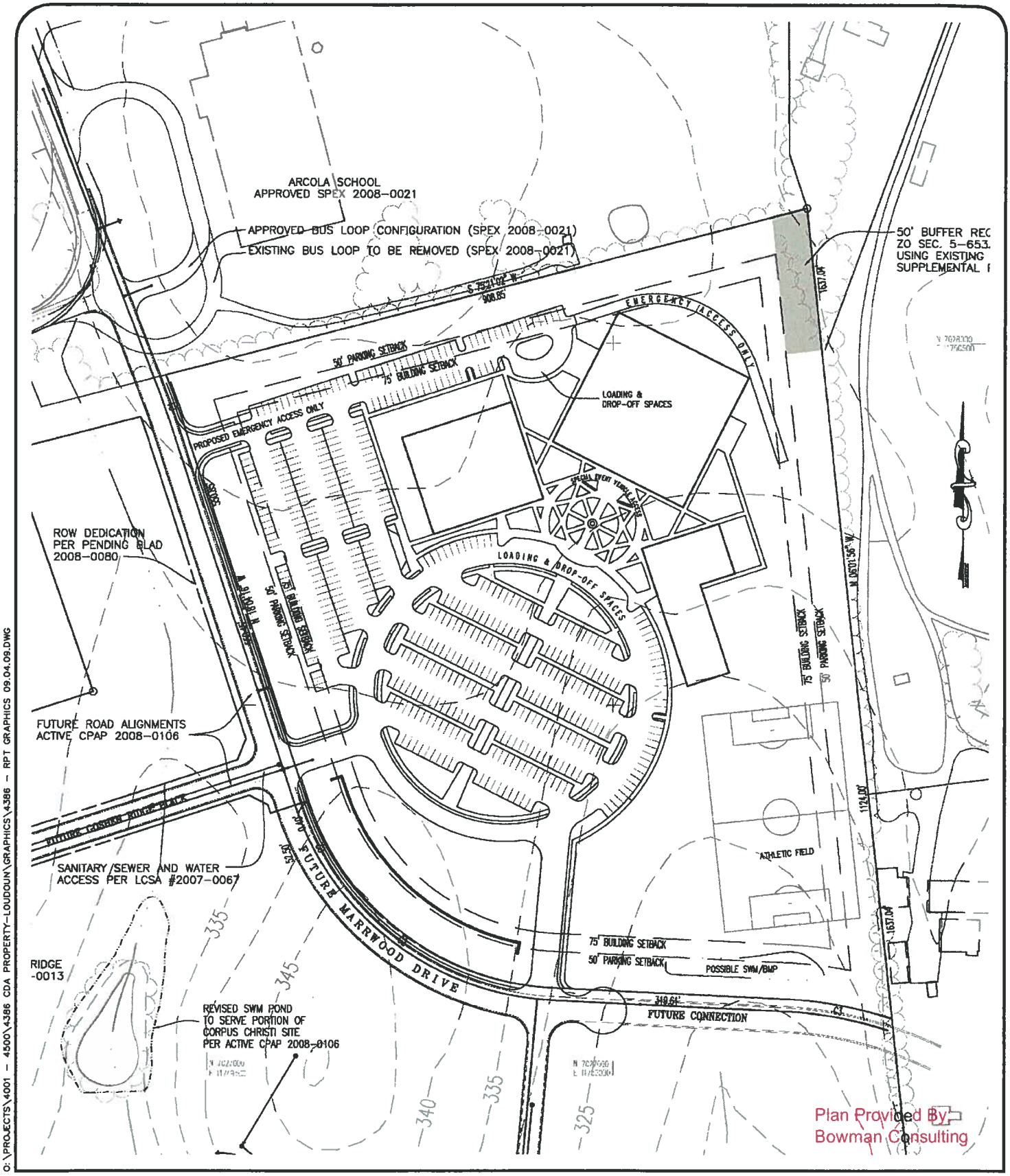

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Figure 2-1
Generalized Development Plan

North

JCP

Catholic Diocese of Arlington
Loudoun County, Virginia

Wells + Associates, Inc.

ATTACHMENT 2

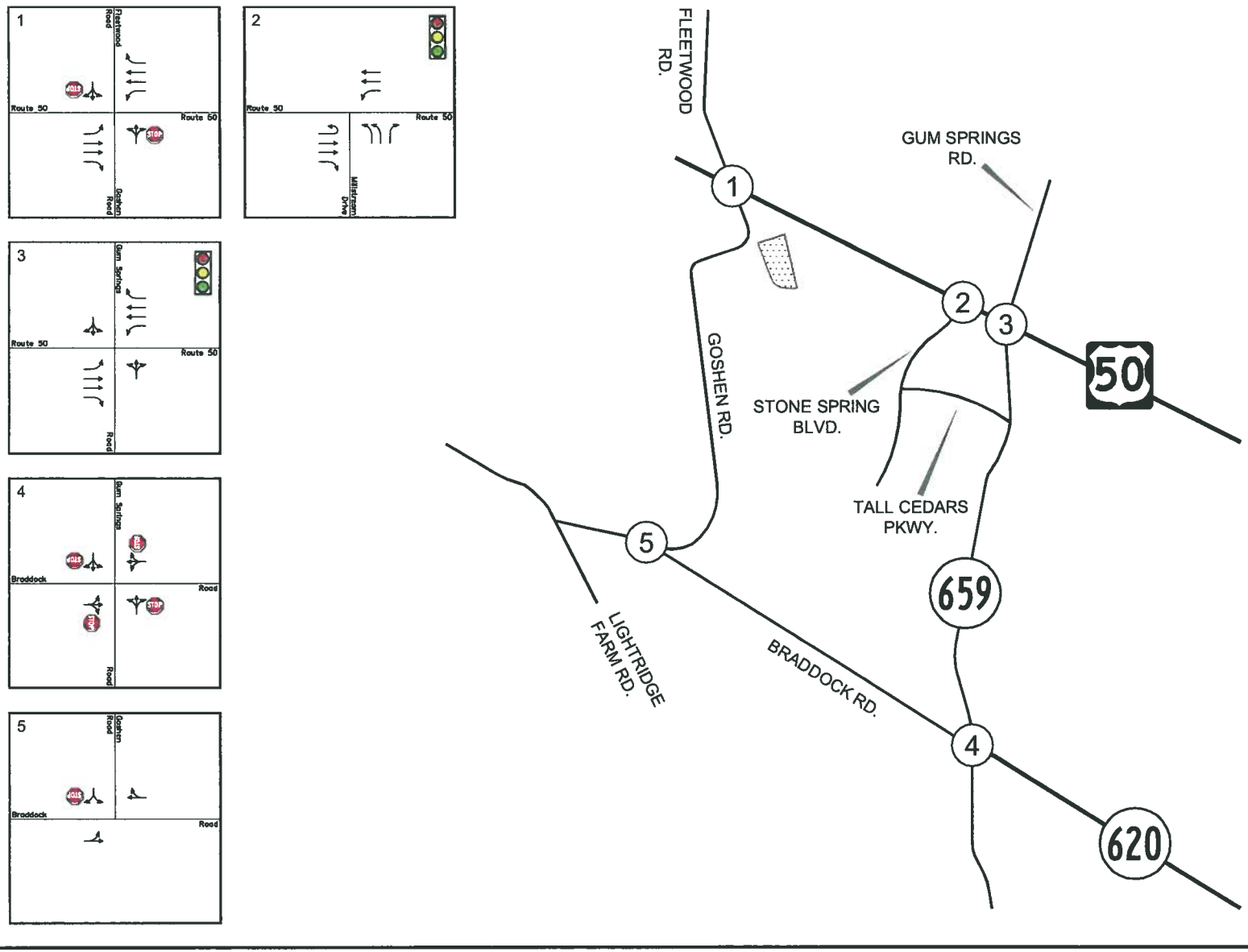


Figure 2-3
Existing Lane Use and Traffic Control

← Represents One Travel Lane
Signalized Intersection
STOP Stop Sign

North

Catholic Diocese of Arlington
Loudoun County, Virginia

ATTACHMENT 3

Wells + Associates, Inc.

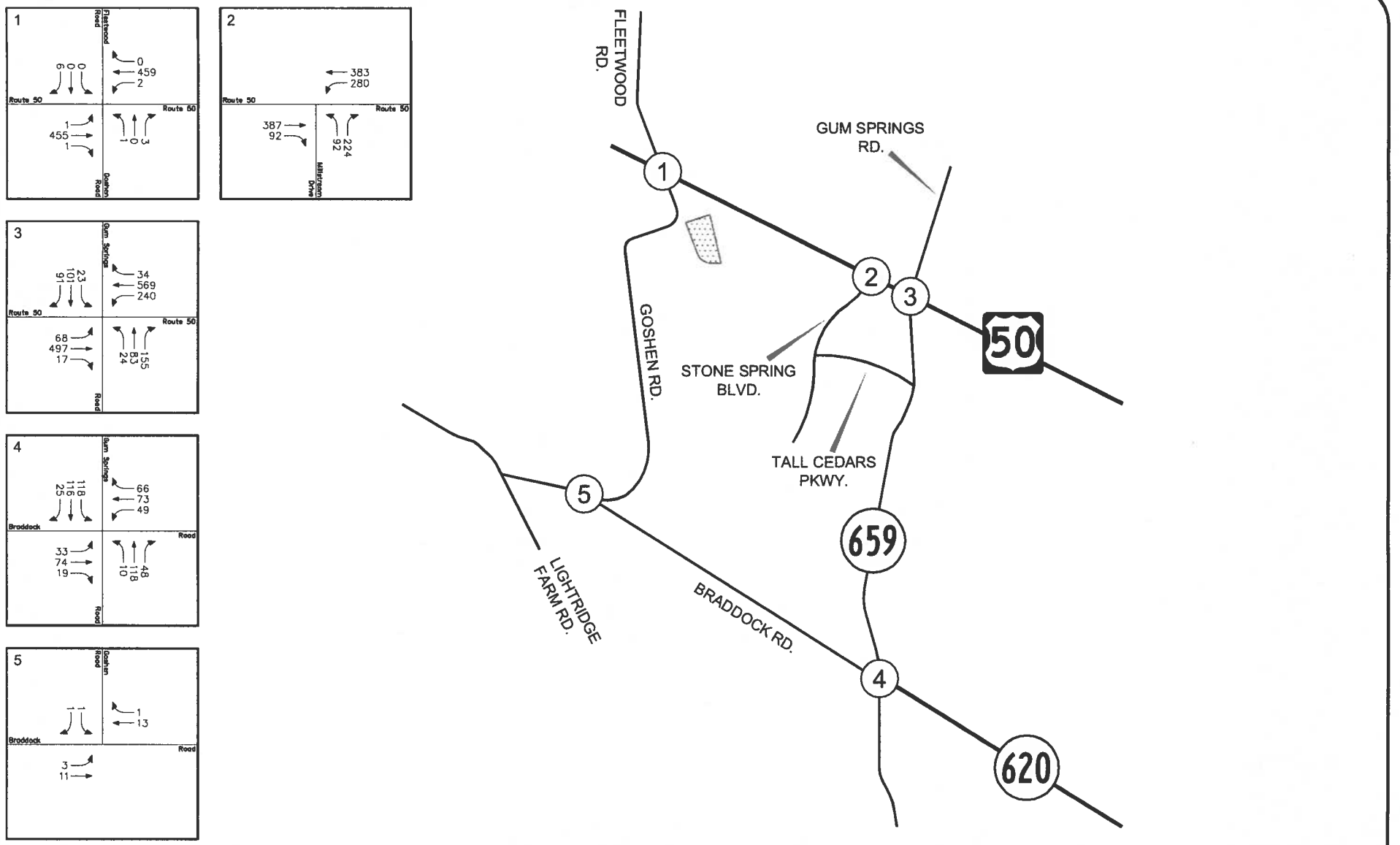


Figure 3-1
2008 Existing Peak Hour Traffic Volumes (Sunday)

SUN PEAK HOUR
000

North

Catholic Diocese of Arlington
Loudoun County, Virginia

ATTACHMENT 4

Wells + Associates, Inc.

Table 3-1
Catholic Diocese of Arlington Loudoun Property
Sunday Intersection Level of Service

Intersection	Intersection Control	Critical Movement	2008 Existing Sunday
1. John Mosby Highway (Route 50)/ Goshen Road (Route 616)/Fleetwood Road	Unsignalized	EBL	A [8.4]
		WBL	A [8.4]
		NBLTR	B [11.9]
		SBLTR	A [9.9]
2015 Background Improvement: Realign Goshen Road, Construct Westport Boulevard, Install Signal	Signalized	EBL	
		EBT	
		EBR	
		WBL	
		WBT	
		WBR	N/A
		NBLT	
		NBR	
		SBLTR	
		Overall	
2. John Mosby Highway (Route 50)/ Stone Springs Boulevard	Signalized	EBT	C (33.0)
		EBR	C (29.4)
		WBL	D (47.4)
		WBT	A (9.0)
		NBL	D (44.1)
		NBR	C (21.0)
		Overall	**C (28.1)**
2012 Background Improvement: Construct SB Approach Add EB and WB Through Lanes, Optimize Timings	Signalized	EBL	
		EBT	
		EBR	
		WBL	
		WBT	
		WBR	
		NBL	N/A
		NBT	
		NBR	
		SBL	
		SBT	
		SBR	
		Overall	
3. John Mosby Highway (Route 50)/ Gum Spring Road (Route 659)	Signalized	EBL	C (29.8)
		EBT	D (42.0)
		EBR	C (35.0)
		WBL	C (26.7)
		WBT	C (32.9)
		WBR	C (27.1)
		NBLTR	D (53.4)
		SBLTR	D (45.8)
		Overall	**D (38.6)**
Background Improvements: Add EB and WB Through Lanes, Optimize Timings	Signalized	EBL	
		EBT	
		EBR	
		WBL	
		WBT	N/A
		WBR	
		NBLTR	
		SBLTR	
		Overall	
2015 Improvement: Remove Northbound Leg, Remove signal, Convert to RIRO	Unsignalized	SBR	N/A
4. Braddock Road (Route 620)/ Gum Spring Road (Route 659)	Unsignalized	EBLTR	A [10.0]
		WBLTR	B [10.5]
		NBLTR	B [10.1]
		SBLTR	B [11.7]
2012 Background Improvements: Install Signal	Signalized	EBLTR	
		WBLTR	
		NBLTR	N/A
		SBLTR	
		Overall	
2015 Background Improvements: Add Separate Turn Lanes on all Approaches	Signalized	EBL	
		EBT	
		EBR	
		WBL	
		WBT	
		WBR	
		NBL	N/A
		NBT	
		NBR	
		SBL	
		SBT	
		SBR	
		Overall	
5. Braddock Road (Route 620)/ Goshen Road (Route 616)	Unsignalized	EBLT	A [1.6]
		SBLR	A [8.5]

Notes:

Numbers in parentheses () represent delay at signalized intersections in seconds per vehicle.

Numbers in square brackets [] represent delay at unsignalized intersections in seconds per vehicle.

Asterisk [*] represents delay in excess of 999.9 seconds.

ATTACHMENT 5

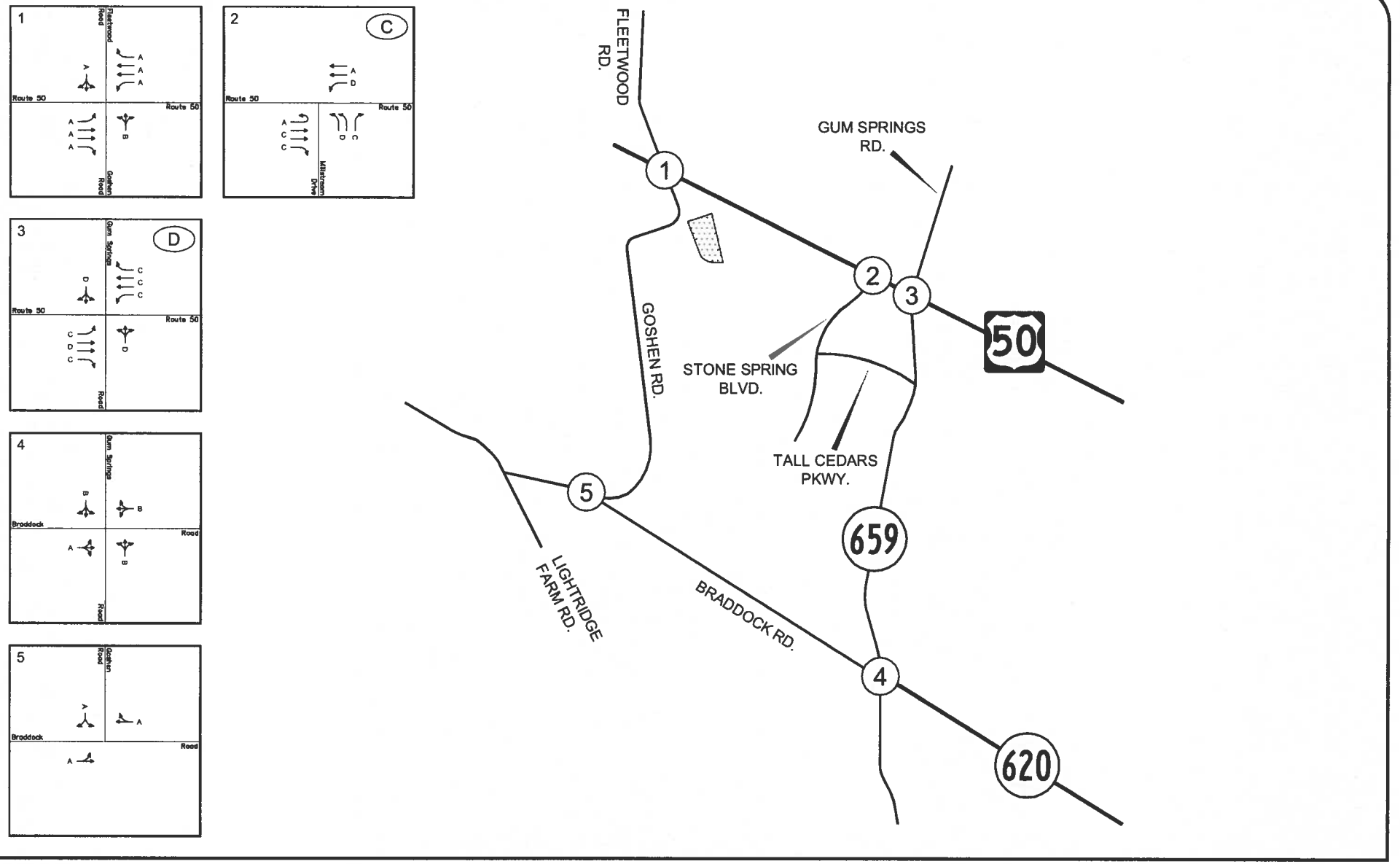


Figure 3-2
2008 Existing Levels of Service (Sunday)

X Levels of Service
(X) Overall Levels of Service

North

Catholic Diocese of Arlington
Loudoun County, Virginia

ATTACHMENT 6

Wells + Associates, Inc.

Table 5-1
Catholic Diocese of Arlington - Loudoun Property
Sunday Site Trip Generation Analysis(1)

Land Use	ITE Land Use Code	Size	Units	Sunday Peak Hour In	Sunday Peak Hour Out	Sunday Peak Hour Total	Sunday ADT
Approved Development							
Single Family Detached(2)	210	19	D.U.	11	10	21	158
Proposed Development							
Phase I							
Church(3)	560	335	Seats	112	104	216	513
PHASE I NET NEW TRIPS (Approved vs. Proposed)				**101**	**94**	**195**	**355**
Phase II							
Church(4)	560	1,200	Seats	387	357	744	1,836
Private School K-8	534	200	Students	-	-	-	-
Convent (Single Familty Detached)(5)	210	1	D.U.	-	-	-	9
Development Total				387	357	744	1,845
BUILDOUT NET NEW TRIPS (Approved vs. Proposed)				**376**	**347**	**723**	**1,687**

Notes:

(1) Traffic estimates based on Institute of Transportation Engineers (ITE) Trip Generation, Seventh Edition.

(2) Peak Hour of Generator

(3) Based on Equivalent 16,200 SF Sanctuary.

(4) Based on Equivalent 58,000 SF Sanctuary.

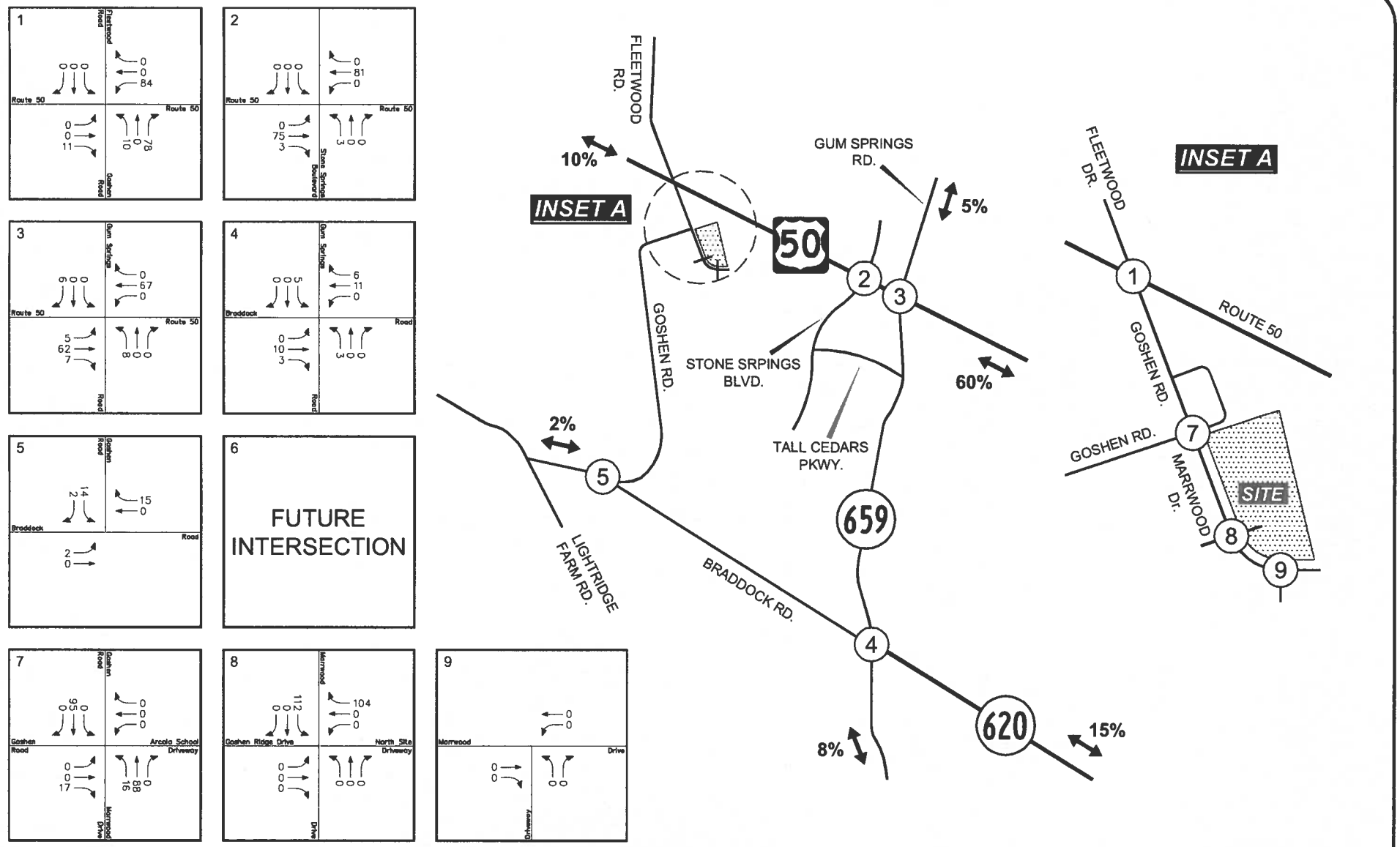


Figure 5-1
2012 Site Generated Traffic Assignments and Directional Distributions (Sunday)
335 Seat Church

XX% Directional Distribution

SUN PEAK HOUR
000

North

Catholic Diocese of Arlington
Loudoun County, Virginia

ATTACHMENT 8

Wells + Associates, Inc.

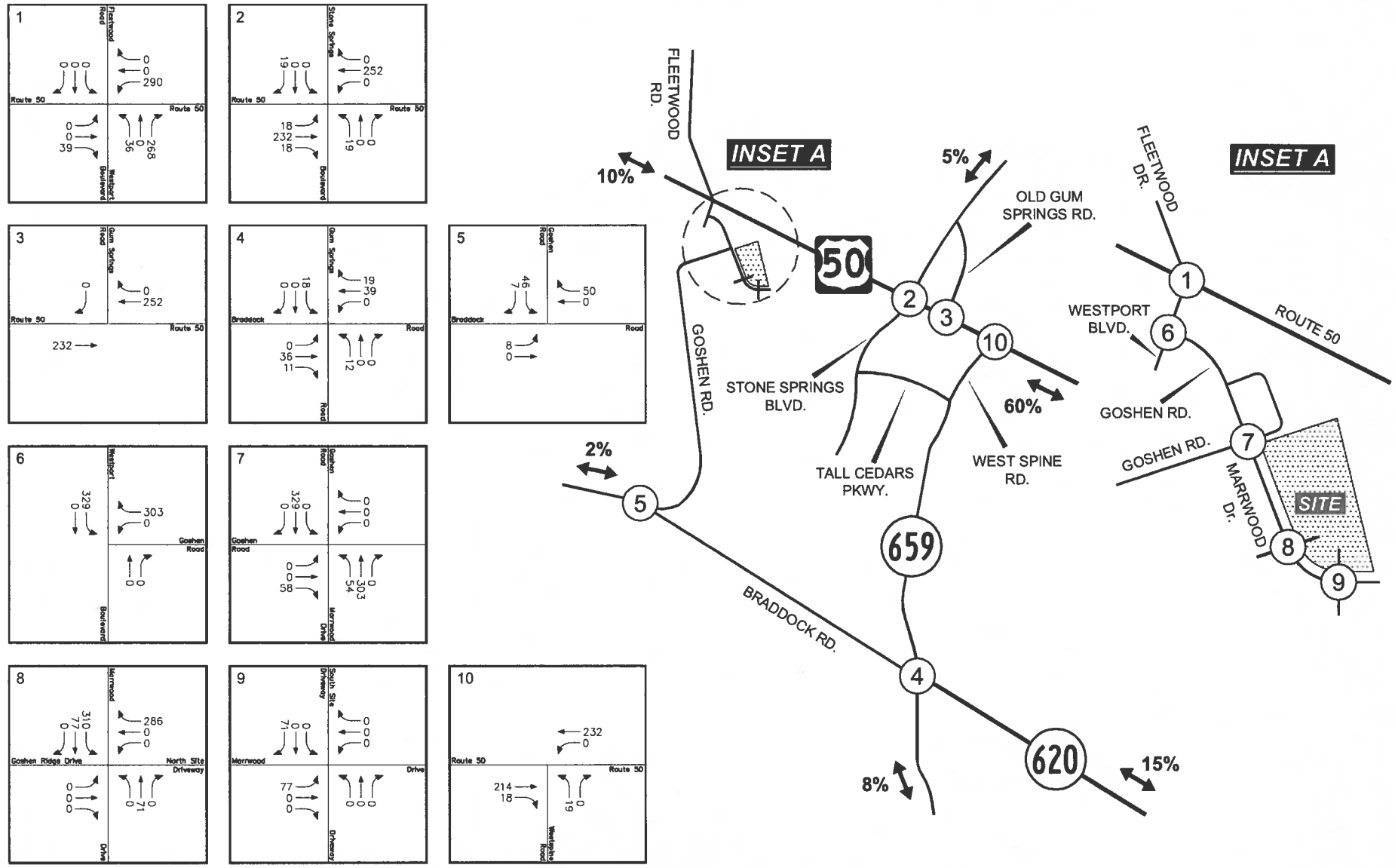


Figure 5-2
2015 Site Generated Traffic Assignments and Directional Distributions (Sunday)
1,200 Seat Church and 200 Student Private School

XX% Directional Distribution

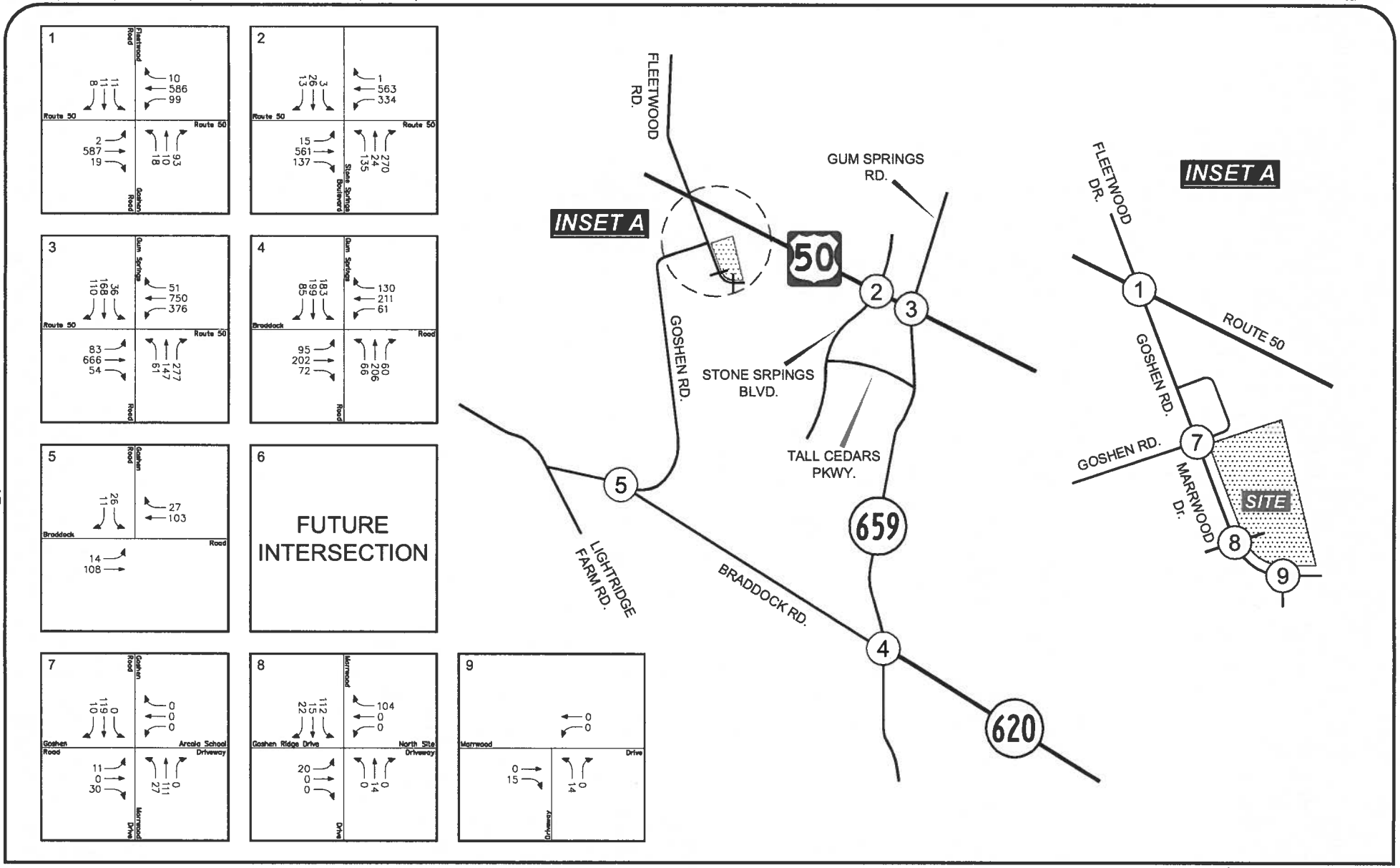
000 SUN PEAK HOUR

North

Catholic Diocese of Arlington
Loudoun County, Virginia

ATTACHMENT 9

Wells + Associates, Inc.



45

Figure 6-1
2012 Peak Hour Traffic Assignments with Special Exception Use (Sunday)

SUN PEAK HOUR
000

North

Catholic Diocese of Arlington
Loudoun County, Virginia

ATTACHMENT 10

Wells + Associates, Inc.

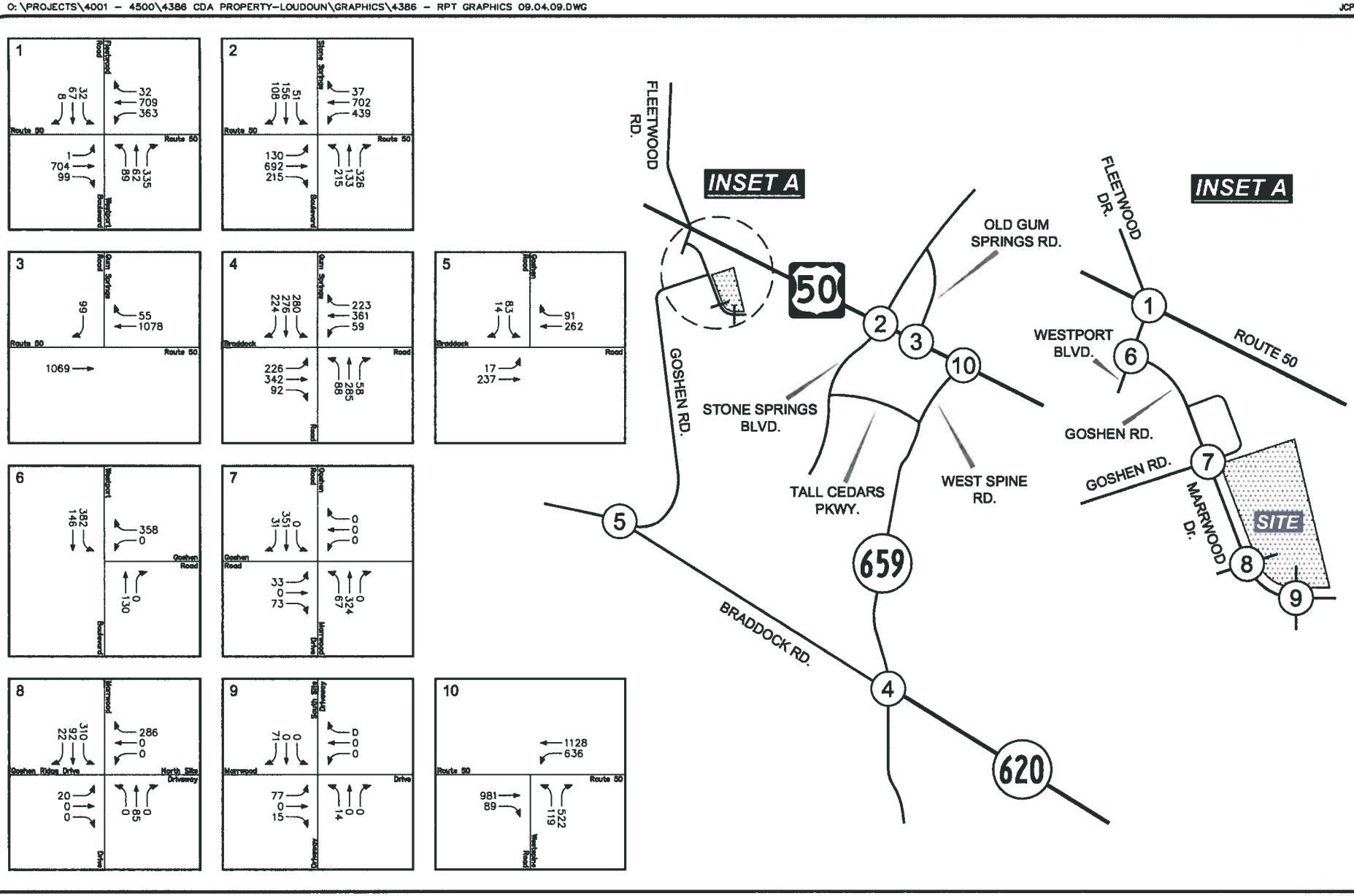


Figure 6-2
2015 Peak Hour Traffic Forecasts with Special Exception Use (Sunday)

ATTACHMENT 11

Catholic Diocese of Arlington
Loudoun County, Virginia

Wells + Associates, Inc.

Table 6-1
Catholic Diocese of Arlington Loudoun Property
Sunday Intersection Level of Service

Intersection	Intersection Control	Critical Movement	2008 Existing Sunday	Background 2012 Sunday	Background 2015 Sunday	Total Future 2012 Sunday	Total Future 2015 Sunday
1. John Mosby Highway (Route 50)/ Goshen Road (Route 616)/Fleetwood Road	Unsignalized	EBL	A [8.4]	A [8.9]		A [8.9]	
		WBL	A [8.4]	A [9.0]	N/A	A [9.8]	N/A
		NBLTR	B [11.9]	C [23.8]		D [27.1]	
		SBLTR	A [9.9]	C [24.1]		E [49.7]	
2015 Background Improvement (Westport): Realign Goshen Road, Construct Westport Boulevard, Install Signal	Signalized	EBL			A (8.5)		B (12.6)
		EBT			B (12.1)		B (17.6)
		EBR			A (9.2)		B (13.6)
		WBL			A (5.6)		B (15.1)
		WBT	N/A	N/A	A (9.0)	N/A	A (8.6)
		WBR			A (6.9)		A (6.7)
		NBLT			B (18.9)		C (26.8)
		NBR			B (13.0)		B (15.5)
		SBLTR			B (18.5)		C (23.9)
		Overall			B (11.3)		B (14.9)
2. John Mosby Highway (Route 50)/ Stone Springs Boulevard	Signalized	EBT	C (33.0)				
		EBR	C (29.4)				
		WBL	D (47.4)				
		WBT	A (9.0)	N/A	N/A	N/A	N/A
		NBL	D (44.1)				
		NBR	C (21.0)				
		Overall	C (28.1)				
2012 Background Improvement: Construct SB Approach Add EB and WB Through Lanes, Optimize Timings	Signalized	EBL		C (20.3)	D (38.2)	C (20.1)	D (46.2)
		EBT		C (22.2)	C (31.4)	C (22.4)	C (32.2)
		EBR		C (20.2)	C (29.2)	C (20.0)	C (28.6)
		WBL		C (23.2)	D (35.2)	C (24.1)	D (43.2)
		WBT		A (8.2)	B (12.3)	A (8.2)	B (12.6)
		WBR		A (7.3)	B (11.3)	A (7.2)	B (10.8)
		NBL	N/A	C (25.6)	D (39.4)	C (26.7)	D (47.4)
		NBT		B (16.8)	C (21.6)	B (17.7)	C (27.6)
		NBR		A (9.5)	B (10.5)	B (10.3)	B (15.2)
		SBL		C (29.1)	D (35.7)	C (30.2)	D (43.2)
		SBT		C (30.6)	D (38.9)	C (31.8)	D (48.3)
		SBR		C (29.0)	C (33.8)	C (30.1)	D (41.0)
		Overall		B (17.2)	C (26.8)	B (17.5)	C (29.8)
3. John Mosby Highway (Route 50)/ Gum Spring Road (Route 659)	Signalized	EBL	C (29.6)	D (36.8)			
		EBT	D (42.0)	E (57.3)			
		EBR	C (35.0)	D (43.0)			
		WBL	C (26.7)	F (100.4)			
		WBT	C (32.9)	D (40.1)	N/A	N/A	N/A
		WBR	C (27.1)	C (31.4)			
		NBLTR	D (53.4)	F (133.3)			
		SBLTR	D (45.8)	E (76.5)			
		Overall	D (38.6)	E (73.7)			
Background Improvements: Add EB and WB Through Lanes, Optimize Timings	Signalized	EBL		D (36.8)		D (37.0)	
		EBT		D (50.4)		D (51.2)	
		EBR		D (43.2)		D (43.2)	
		WBL		D (44.9)		D (49.2)	
		WBT	N/A	C (34.0)	N/A	C (34.2)	N/A
		WBR		C (29.2)		C (28.9)	
		NBLTR		C (28.2)		C (30.1)	
		SBLTR		C (24.6)		C (25.6)	
		Overall		D (37.4)		D (38.7)	
2015 Improvement: Remove Northbound Leg, Remove signal, Convert to RIRO	Unsignalized	SBR	N/A	N/A	A [9.8]	N/A	A [9.1 [
4. Braddock Road (Route 620)/ Gum Spring Road (Route 659)	Unsignalized	EBLTR	A [10.0]	F [81.8]			
		WBLTR	B [10.5]	F [101.5]	N/A	N/A	N/A
		NBLTR	B [10.1]	F [65.6]			
		SBLTR	B [11.7]	F [186.8]			
2012 Background Improvements: Install Signal	Signalized	EBLTR		C (24.9)	F (498.6)	C (26.7)	
		WBLTR		C (21.5)	E (71.0)	C (22.8)	
		NBLTR	N/A	B (12.8)	B (19.6)	B (13.3)	N/A
		SBLTR		C (22.4)	F (187.0)	C (23.9)	
		Overall		C (20.7)	F (209.4)	C (22.1)	
2015 Background Improvements: Add Separate Turn Lanes on all Approaches	Signalized	EBL			C (21.0)		C (22.1)
		EBT			C (22.6)		C (22.6)
		EBR			B (16.0)		B (14.8)
		WBL			C (23.5)		C (22.9)
		WBT			D (36.9)		D (38.7)
		WBR			B (16.9)		B (16.3)
		NBL	N/A	N/A	C (24.4)	N/A	C (25.2)
		NBT			D (36.2)		D (40.9)
		NBR			C (23.7)		C (25.2)
		SBL			C (24.2)		C (30.3)
		SBT			C (23.6)		C (26.0)
		SBR			B (12.9)		B (14.4)
		Overall			C (24.8)		C (26.8)
5. Braddock Road (Route 620)/ Goshen Road (Route 616)	Unsignalized	EBLT	A [1.6]	A [0.9]	A [0.4]	A [0.9]	A [0.7]
		SBLR	A [8.5]	A [8.9]	B [13.0]	B [10.0]	C [15.0]
6. Westport Boulevard/ Goshen Road (Route 616)	Unsignalized	WBLR	N/A	N/A	A [9.0]	N/A	B [11.1]
		SBL			A [7.6]		A [7.6]
7. Goshen Road (Route 616)/ Arcola School Driveway/Marrwood Drive	Unsignalized	EBLTR	N/A	A [8.9]	A [9.2 [	A [9.7]	C [16.3]
		WBLTR	N/A	A [0.0]	A [0.0]	A [0.0]	A [0.0]
		NBLTR	N/A	A [2.5]	A [2.9]	A (1.6]	A [2.0]
		SBLTR	N/A	A [0.0]	A [0.0]	A [0.0]	A [0.0]
8. Marrwood Drive/ North Site Driveway/Goshen Ridge Place	Unsignalized	EBLTR				B [13.0]	F [55.6]
		WBLTR	N/A	N/A	N/A	A [8.8]	B [10.5]
		NBLTR				A [5.7]	A [6.4]
9. Marrwood Drive/ South Site Driveway/Marrwood Driveway *Note: South Site Driveway Constructed in 2015.*	Unsignalized	EBLTR				A [8.6]	B [10.9]
		WBLTR	N/A	N/A	N/A	A [0.0]	A [8.6]
		SBLTR				A [0.0]	A [6.2]
10. John Mosby Highway (Route 50)/ West Spine Road	Signalized	EBT			C (34.9)		D (38.6)
		EBR			B (11.3)		B (11.1)
		WBL			C (32.2)		D (35.5)
		WBT	N/A	N/A	A (9.9)	N/A	B (10.8)
		NBL			C (26.3)		C (28.3)
		NBR			B (10.5)		B (12.1)
		Overall			C (21.7)		C (24.0)

Notes:
Numbers in parentheses () represent delay at signalized intersections in seconds per vehicle.
Numbers in square brackets [] represent delay at unsignalized intersections in seconds per vehicle
Asterisk [*] represents delay in excess of 999.9 seconds.

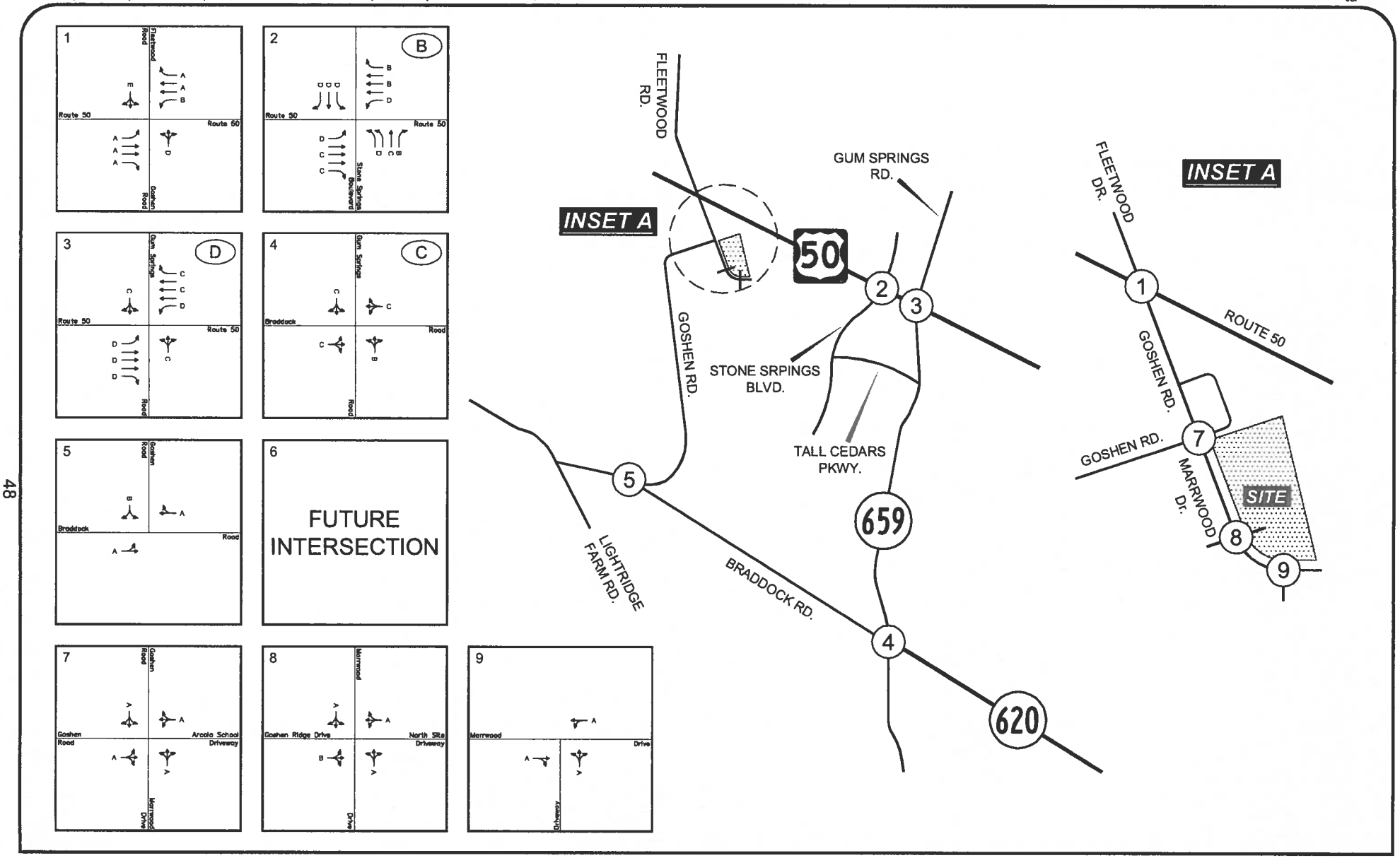


Figure 6-3
2012 Levels of Service with Special Exception Use (Sunday)

X Levels of Service
(X) Overall Levels of Service

North

Catholic Diocese of Arlington
Loudoun County, Virginia

ATTACHMENT 13

Wells + Associates, Inc.

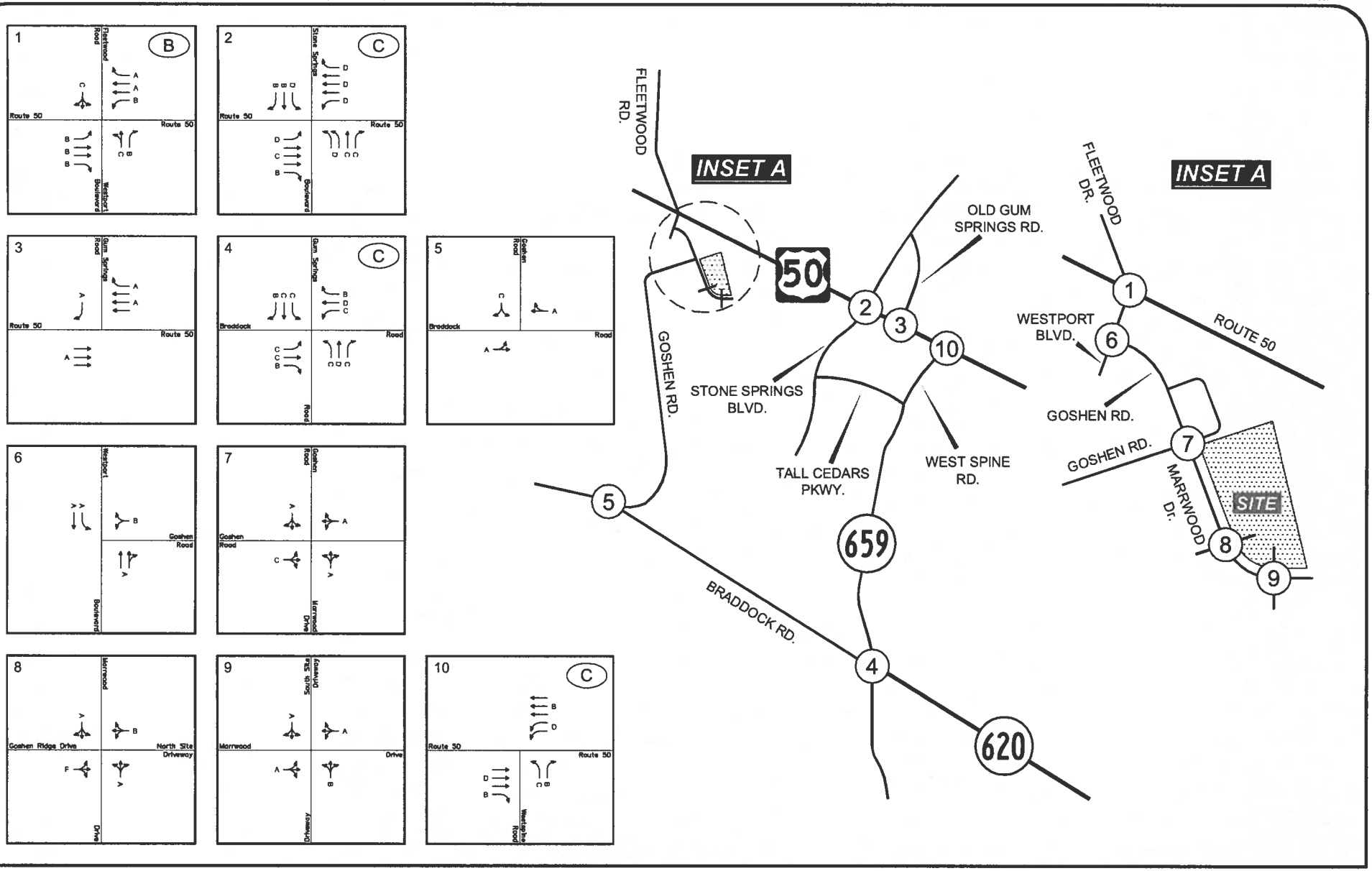


Figure 6-4
2015 Levels of Service with Special Exception Use (Sunday)

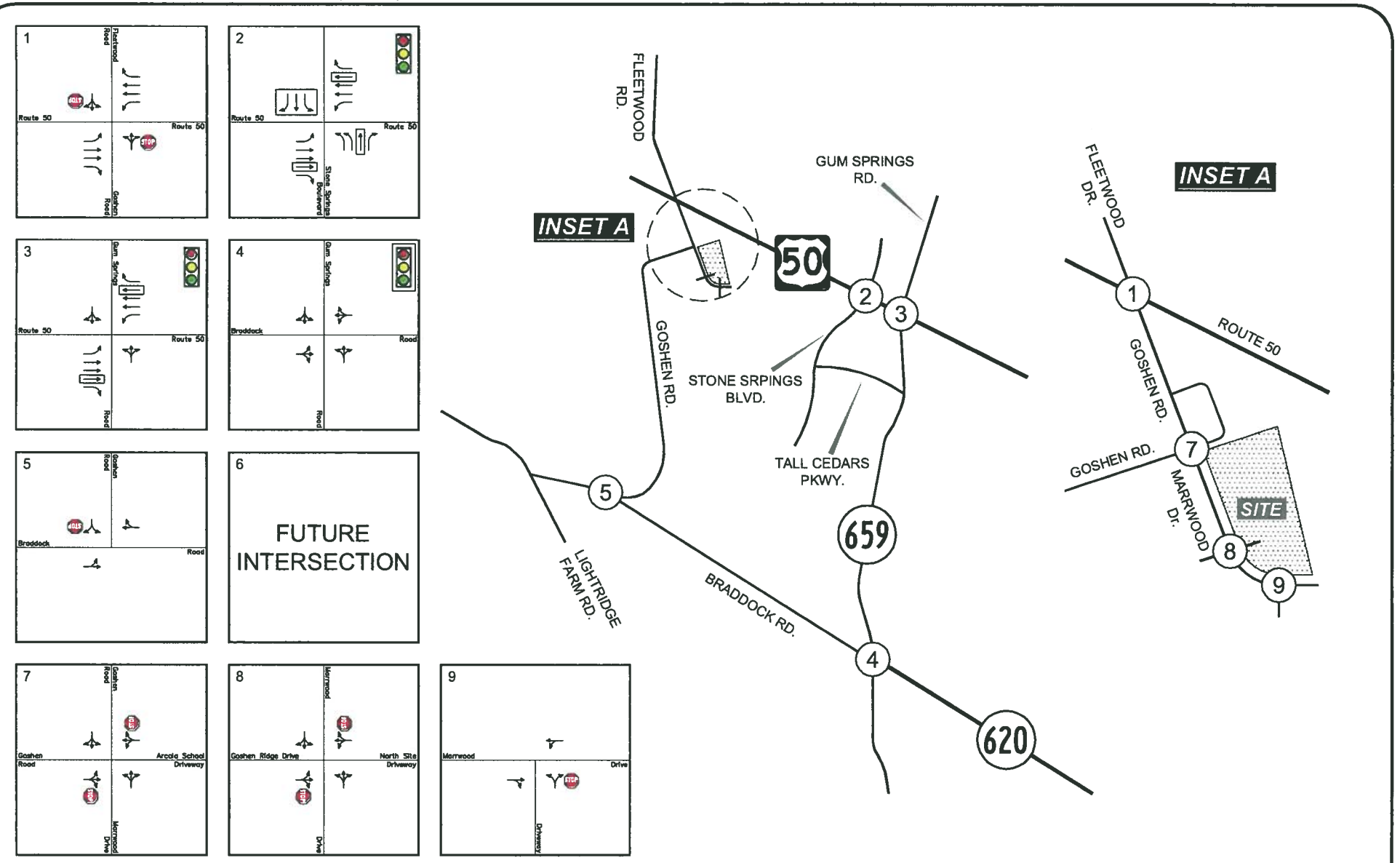
X Levels of Service
(X) Overall Levels of Service

North

Catholic Diocese of Arlington
Loudoun County, Virginia

ATTACHMENT 14

Wells + Associates, Inc.



25

Figure 4–1
2012 Planned Lane Use and Traffic Control (Sunday)

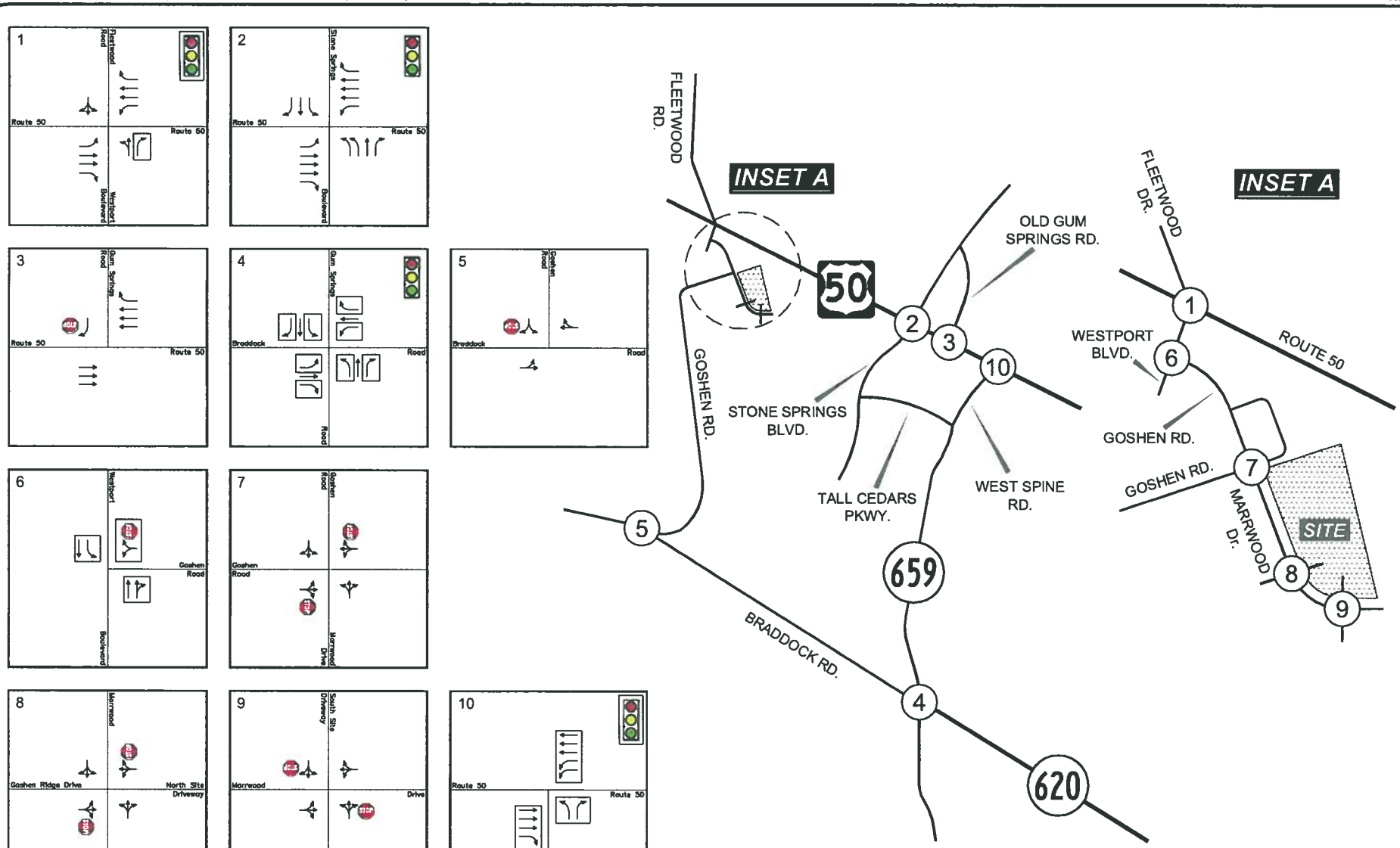
← Represents One Travel Lane
Signalized Intersection
Stop Sign
Background Improvement

North

Catholic Diocese of Arlington
Loudoun County, Virginia

ATTACHMENT 15

Wells + Associates, Inc.



26

Figure 4-2
2015 Planned Lane Use and Traffic Control (Sunday)

Represents One Travel Lane
Signalized Intersection
Stop Sign
Background Improvement

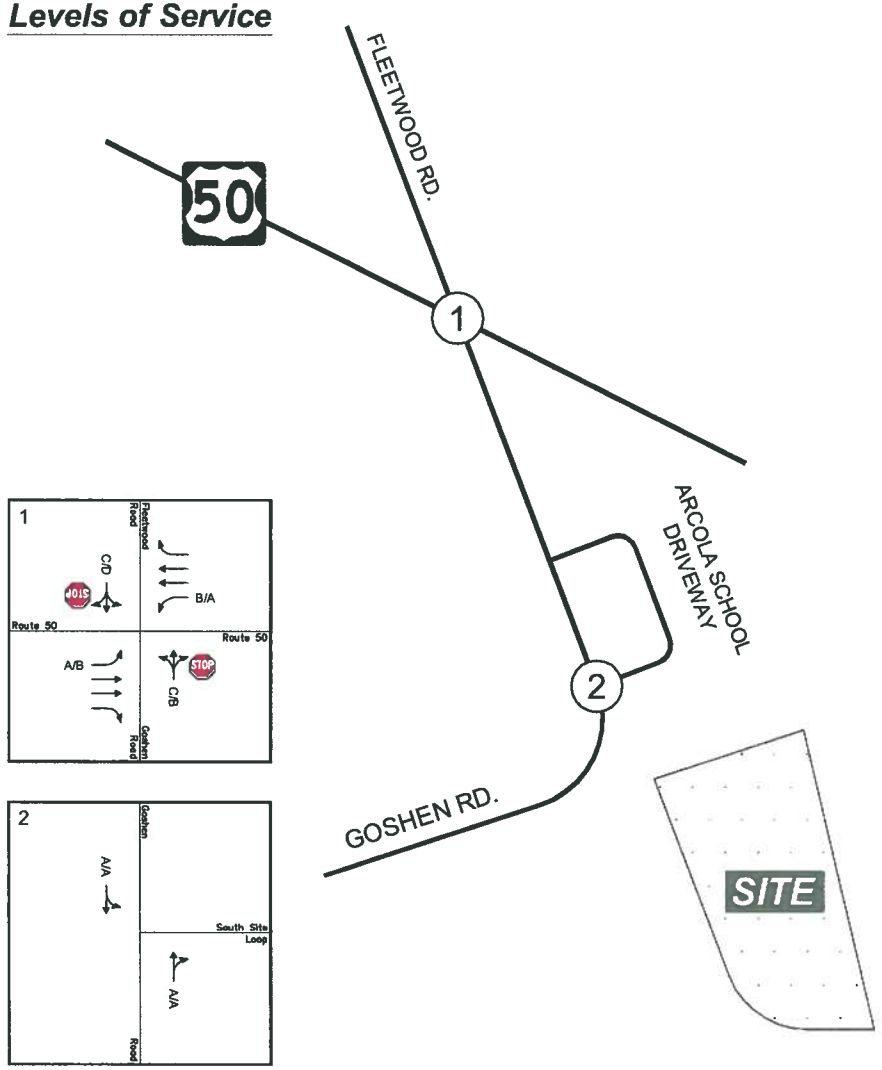
North

Catholic Diocese of Arlington
Loudoun County, Virginia

ATTACHMENT 16

Wells + Associates, Inc.

Existing Lane Use and Traffic Control, and Levels of Service



Existing Peak Hour Traffic Counts and ADT

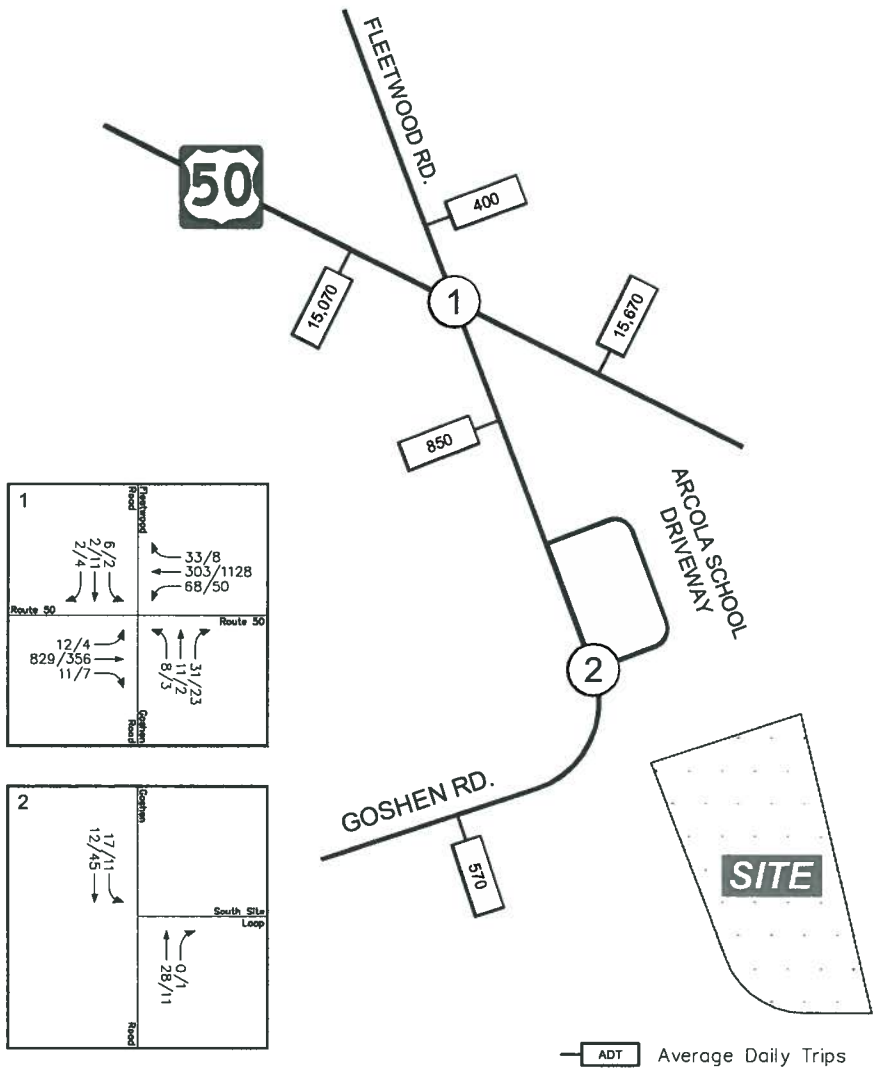


Figure 9-1
Existing Weekday Peak Hour Traffic Volumes, Levels of Service and Existing Lane Use and Traffic Control

X/X Levels of Service
(X/X) Overall Levels of Service
Represents One Travel Lane
Signalized Intersection
STOP Stop Sign
AM PEAK HOUR
PM PEAK HOUR
000/000
North

Catholic Diocese of Arlington
Loudoun County, Virginia

ATTACHMENT 17

Wells + Associates, Inc.

Table 9-1
Catholic Diocese of Arlington Loudoun Property
Weekday Intersection Level of Service

Intersection	Intersection Control	Critical Movement	2008 Existing AM	2008 Existing PM	2012 Background Future AM	2012 Background Future PM	2012 Total Future AM	2012 Total Future PM	2015 Background Future AM	2015 Background Future PM	2015 Total Future AM	2015 Total Future PM
1. John Mosby Highway (Route 50)/ Goshen Road (Route 616)/Fleetwood Road	Unsignalized	EBL	A [8.1]	B [11.7]	A [8.5]	B [13.5]	A [8.5]	B [13.5]	N/A		N/A	
		WBL	B [10.5]	A [8.3]	B [13.5]	A [9.7]	B [13.6]	A [9.7]				
		NBLTR	C [17.2]	B [12.3]	F [186.2]	F [135.3]	F [172.3]	F [113.5]				
		SBLTR	C [18.3]	D [27.6]	F [206.6]	F [186.9]	F [206.6]	F [176.6]				
2015 Background Improvement: Realign Goshen Road, Construct Westport Boulevard, Install Signal	Signalized	EBL	N/A		N/A		N/A		B (13.1)	B (15.1)	B (15.5)	B (15.4)
		EBT							C (25.2)	B (16.0)	C (30.2)	B (16.2)
		EBR							B (14.2)	B (12.8)	B (17.1)	B (13.4)
		WBL							B (17.7)	A (8.7)	C (34.3)	A (9.8)
		WBT							B (10.9)	C (22.7)	B (11.9)	C (22.7)
		WBR							A (9.0)	A (7.8)	A (9.8)	A (7.8)
		NBLT							D (42.1)	D (36.7)	D (51.1)	D (44.3)
		NBR							C (23.3)	C (22.0)	C (24.2)	C (21.5)
		SBLTR							C (30.5)	C (32.7)	C (33.1)	C (32.8)
		Overall							**C (22.4)**	**C (20.9)**	**C (27.4)**	**C (21.5)**
2. Goshen Road (Route 616)/ Westport Boulevard	Unsignalized	WBLR	N/A		N/A		N/A		B [11.4]	B [10.2]	B [13.7]	B [11.4]
		SBL							A [8.4]	A [8.0]	A [8.7]	A [8.2]
3. Goshen Road (Route 616)/ Arcola School Driveway/Marrwood Drive	Unsignalized	EBLTR	A [0.0]	A [0.0]	B [11.8]	B [10.3]	B [10.5]	B [10.4]	B [13.9]	B [11.3]	C [20.6]	B [13.4]
		WBLTR	A [0.0]	A [0.0]	A [9.7]	A [9.5]	A [9.6]	A [9.6]	B [11.2]	B [10.5]	B [13.9]	B [12.0]
		NBLTR	N/A	N/A	A [2.4]	A [2.6]	A [2.2]	A [2.5]	A [2.9]	A [3.1]	A [2.3]	A [2.2]
		SBLTR	A [4.3]	A [1.5]	A [4.9]	A [2.3]	A [4.8]	A [2.3]	A [4.3]	A [2.1]	A [3.0]	A [1.8]
4. Marrwood Drive/ North Site Driveway/Goshen Ridge Place	Unsignalized	EBLTR	N/A		A [9.1]	A [9.2]	A [9.0]	A [9.0]	A [9.1]	A [9.2]	B [11.8]	B [10.9]
		WBLTR			A [8.5]	A [8.4]	A [8.4]	A [8.4]	A [8.5]	A [8.4]	A [8.7]	A [8.7]
		SBLTR			A [2.1]	A [1.7]	A [2.1]	A [0.8]	A [2.1]	A [1.7]	A [5.4]	A [3.5]
5. Marrwood Drive/ South Site Driveway/Marrwood Driveway	Unsignalized	EBLTR	N/A		A [7.2]	A [7.2]	A [8.6]	A [8.6]	A [7.2]	A [7.2]	A [7.3]	A [7.3]
		SBLTR			A [8.3]	A [8.4]	A [0.0]	A [0.0]	A [8.3]	A [8.4]	A [9.8]	A [8.6]

Notes:

Numbers in parentheses () represent delay at signalized intersections in seconds per vehicle.

Numbers in square brackets [] represent delay at unsignalized intersections in seconds per vehicle.

Asterisk [*] represents delay in excess of 999.9 seconds.

ATTACHMENT 18

Table 9-2
Catholic Diocese of Arlington - Loudoun Property
Weekday Site Trip Generation Analysis(1)

Land Use	ITE Land Use Code	Size	Units	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Weekday ADT
Approved Development										
Single Family Detached(2)	210	19	D.U.	7	20	27	16	9	25	190
Proposed Development										
Phase I										
Church(3)	560	16,200	S.F.	6	6	12	6	5	11	148
PHASE I NET NEW TRIPS (Approved vs. Proposed)				(1)	(14)	(15)	(10)	(4)	(14)	(42)
Phase II										
Church(4)	560	58,000	S.F.	23	19	42	20	18	38	528
Private School K-8 (5)	534	200	Students	97	79	176	61	69	130	496
Convent (Single Family Detached)(6)	210	1	D.U.	-	-	-	-	-	-	10
Development Total				120	98	218	81	87	168	1,024
BUILDOUT NET NEW TRIPS (Approved vs. Proposed)				**113**	**78**	**191**	**65**	**78**	**143**	**834**

Notes:

(1) Traffic estimates based on Institute of Transportation Engineers (ITE) Trip Generation, Seventh Edition.

(2) Peak Hour of Generator

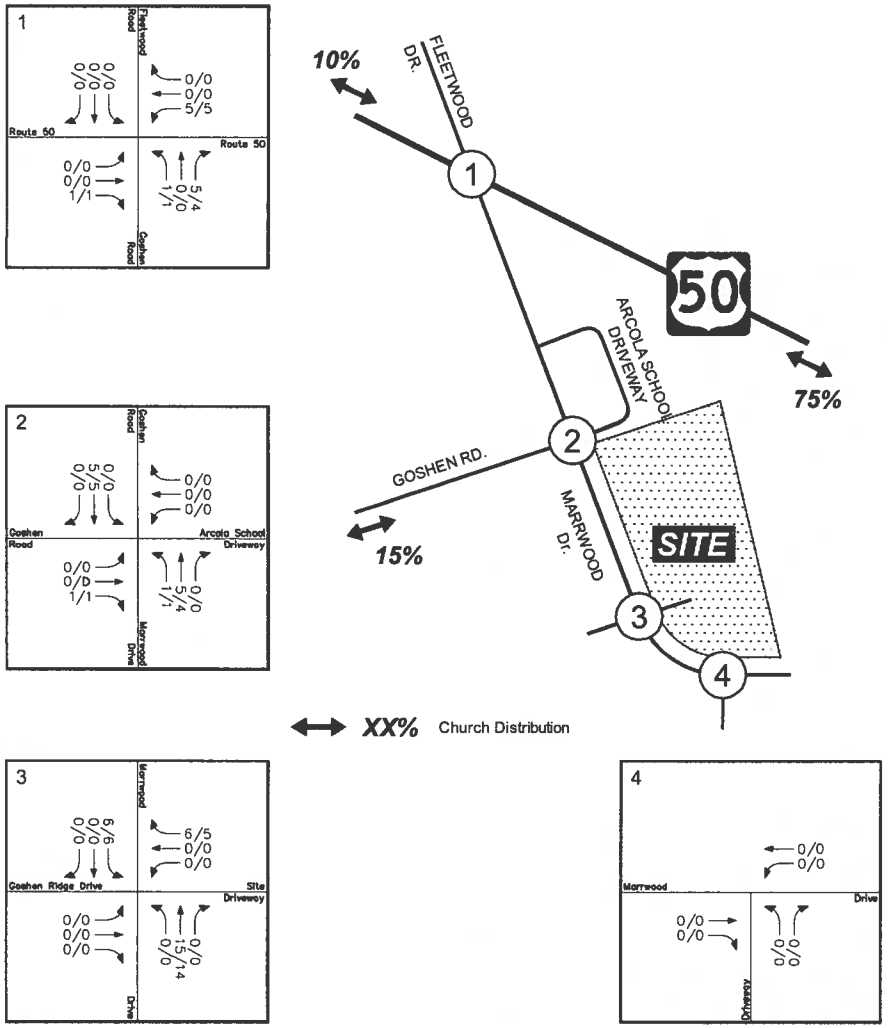
(3) Based on Equivalent 335-seat Sanctuary.

(4) Based on Equivalent 1,200-seat Sanctuary.

(5) PM Peak Hour of Adjacent Street was derived comparing Peak Hour of Generator, similar uses, and counts collected by W+A. ADT assumed ITE Land Use Code 535, K-12 private school.

(6) Convent consisting of 3-10 rooms was assumed to be Single Family Detached Housing Unit, generating no Peak Hour Trips.

2012 - Site Trips (335 Seat Church)



2015 - Site Trips (1,200 Seat Church & 200 Student School)

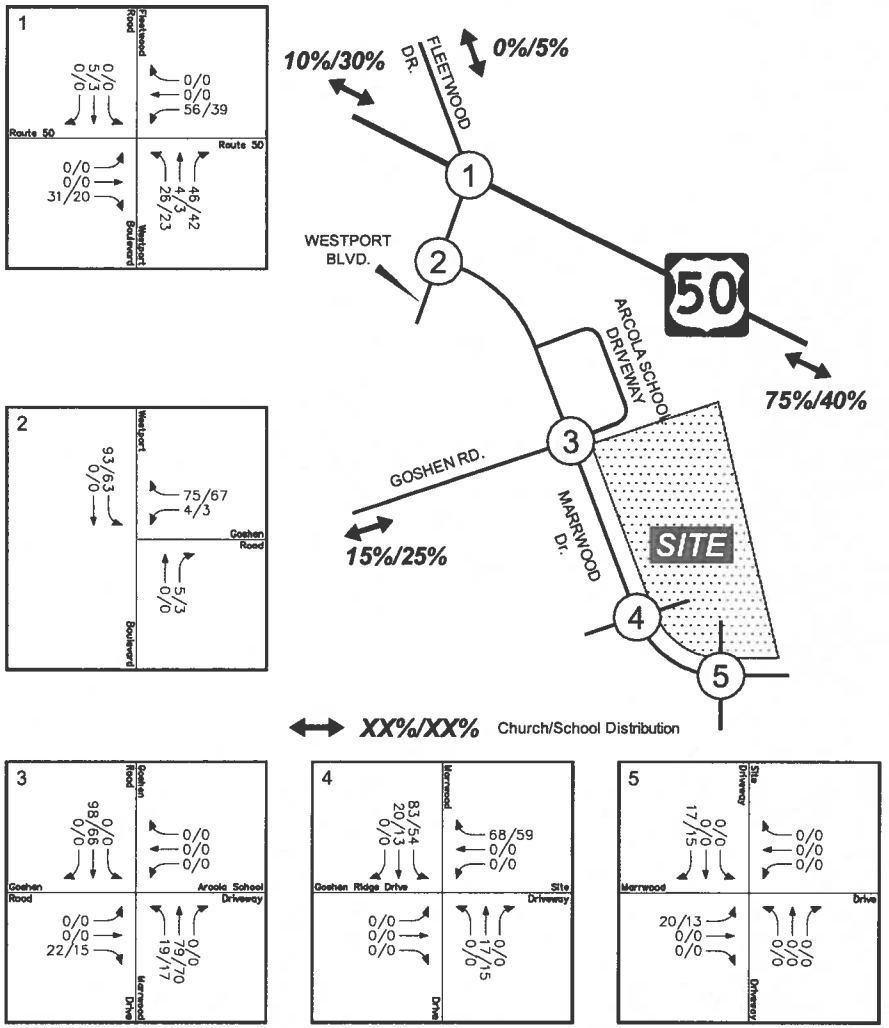


Figure 9-7
Site Generated Traffic Assignments and Directional Distributions (Weekday)

AM PEAK HOUR
PM PEAK HOUR
000/000

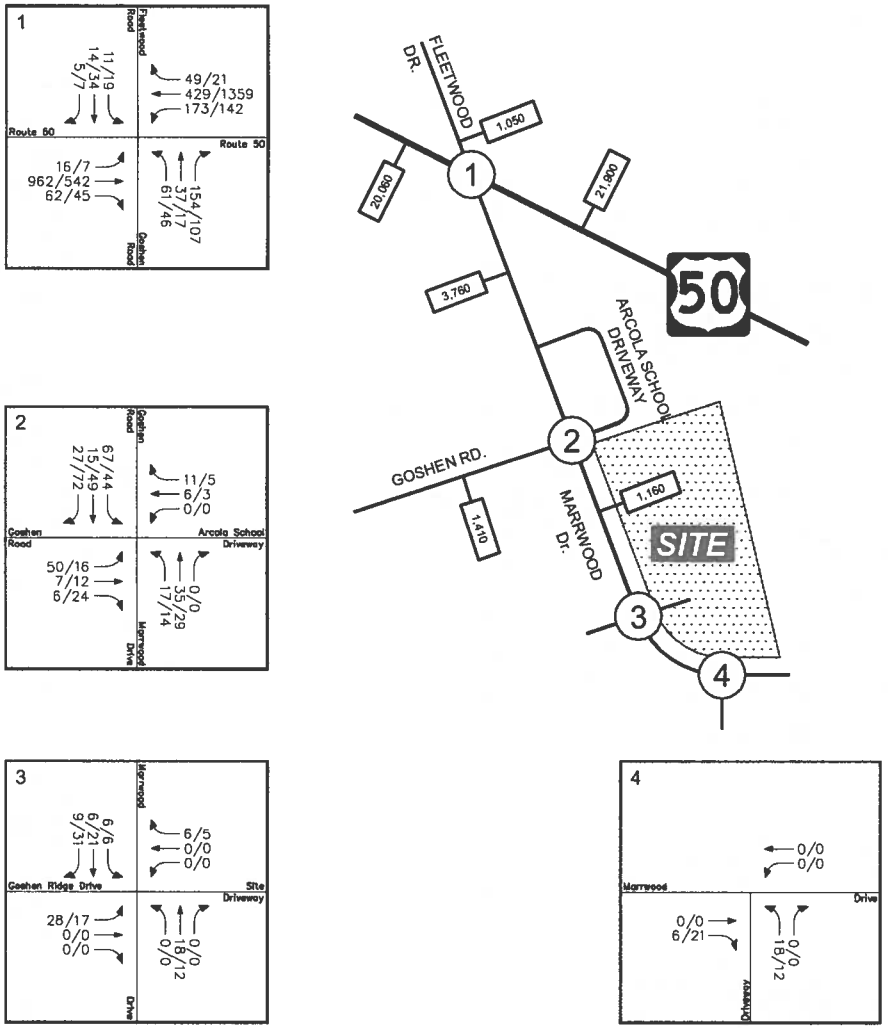
North

Catholic Diocese of Arlington
Loudoun County, Virginia

ATTACHMENT 20

Wells + Associates, Inc.

2012 - Traffic Forecasts with Proposed Program



2015 - Traffic Forecasts with Proposed Program

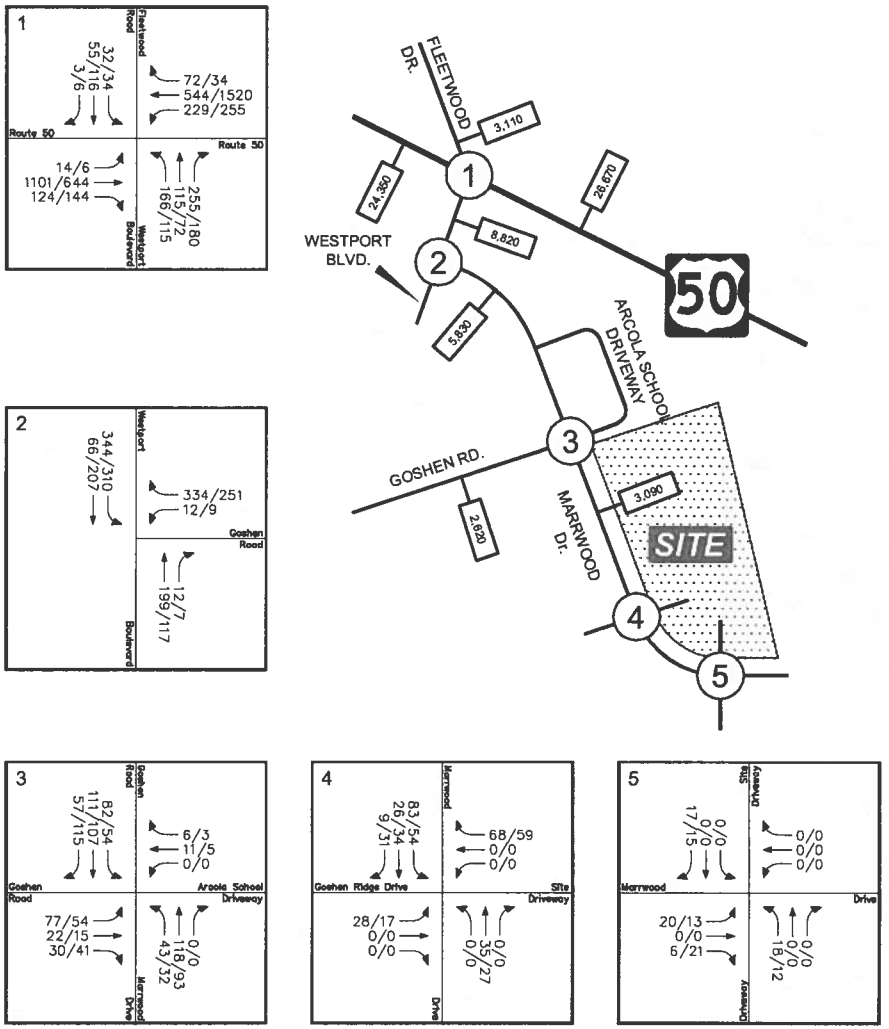


Figure 9-8
Peak Hour Traffic Forecasts with Proposed Development Program (Weekday)

ADT Average Daily Trips

AM PEAK HOUR
PM PEAK HOUR
000/000

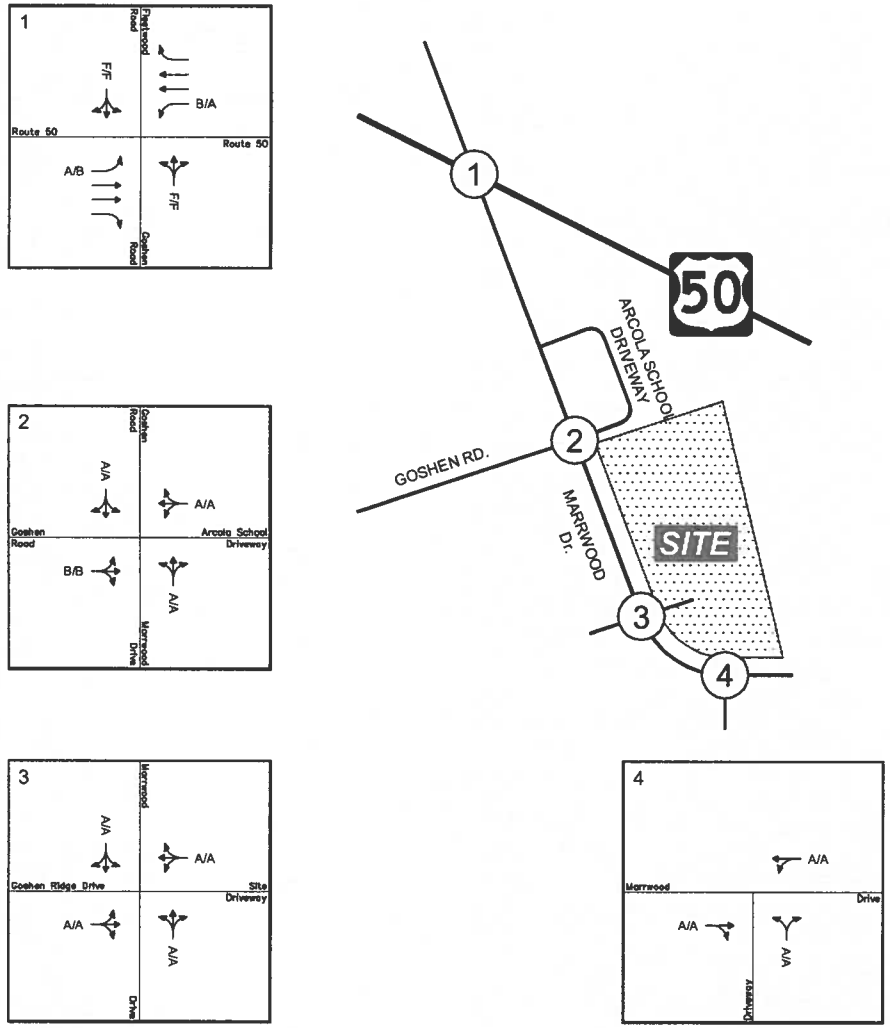
North

Catholic Diocese of Arlington
Loudoun County, Virginia

ATTACHMENT 21

Wells + Associates, Inc.

2012 - Phase I (335 Seat Church)



2015 - Phase II (1,200 Seat Church and 200 Student School)

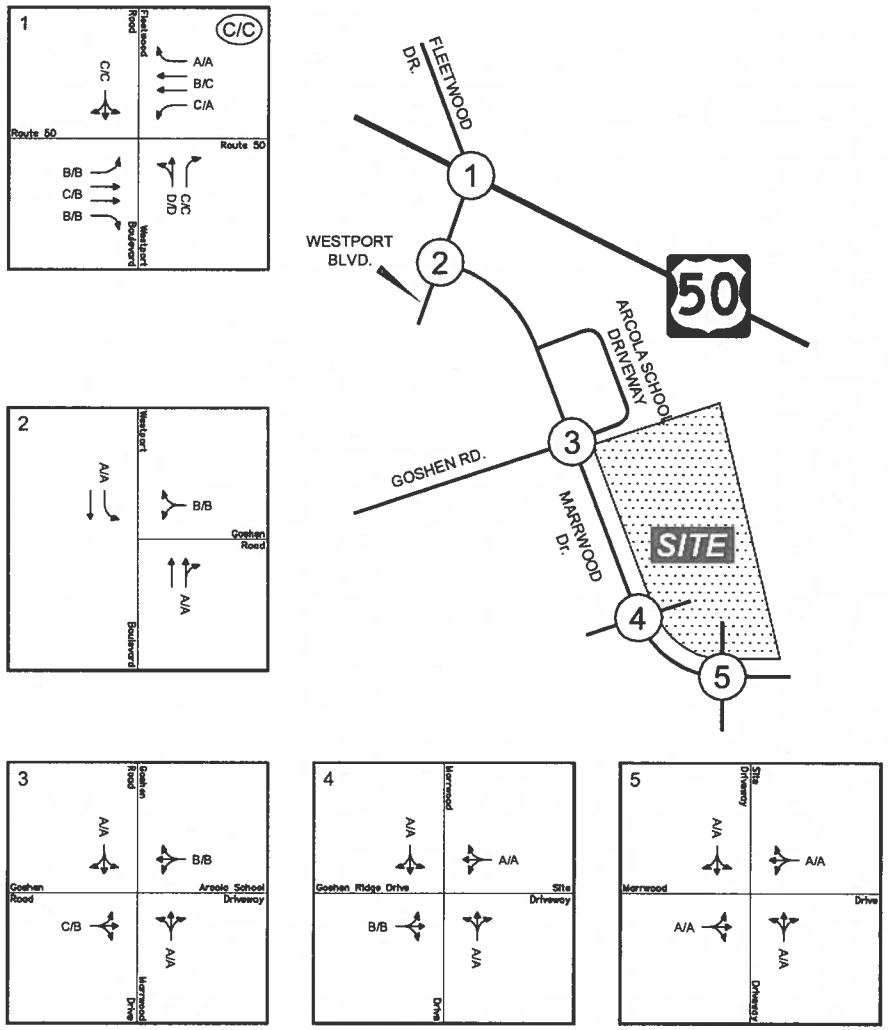


Figure 9-9
Future Levels of Service with Proposed Development Program (Weekday)

x/x Levels of Service
(x/x) Overall Levels of Service

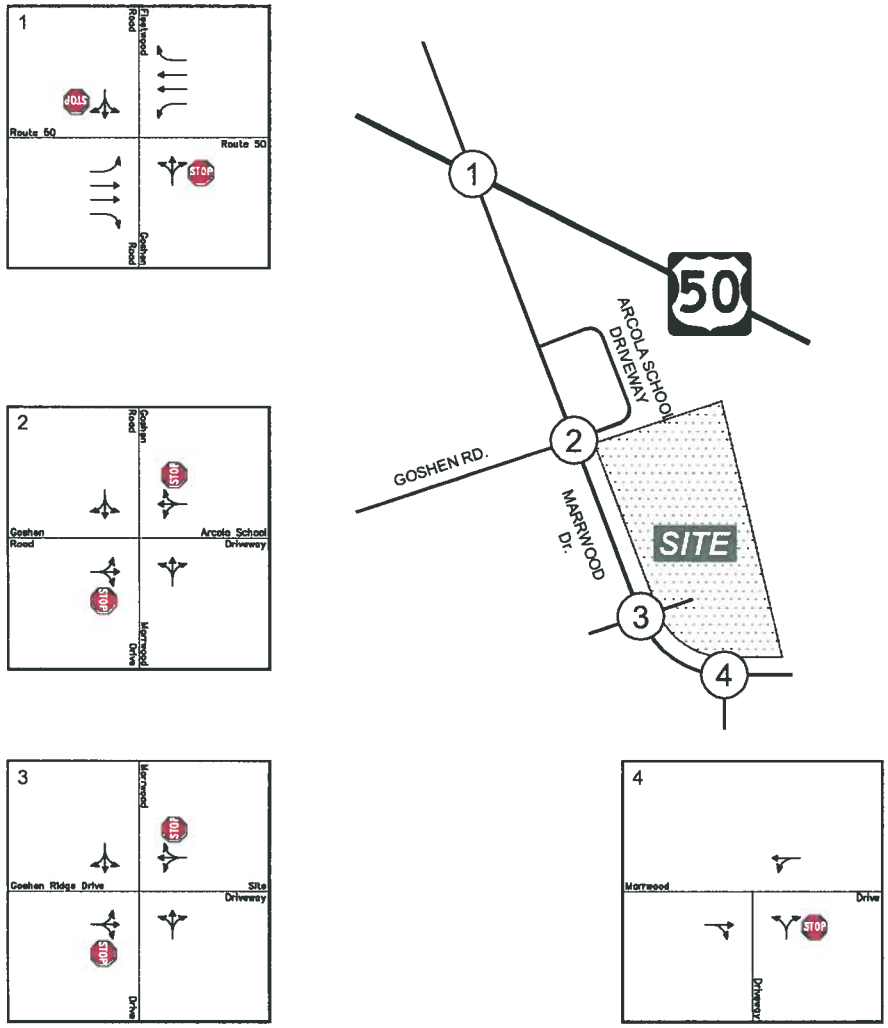
North

Catholic Diocese of Arlington
Loudoun County, Virginia

ATTACHMENT 22

Wells + Associates, Inc.

2012 - Phase I (Church)



2015 - Phase II (Church and School)

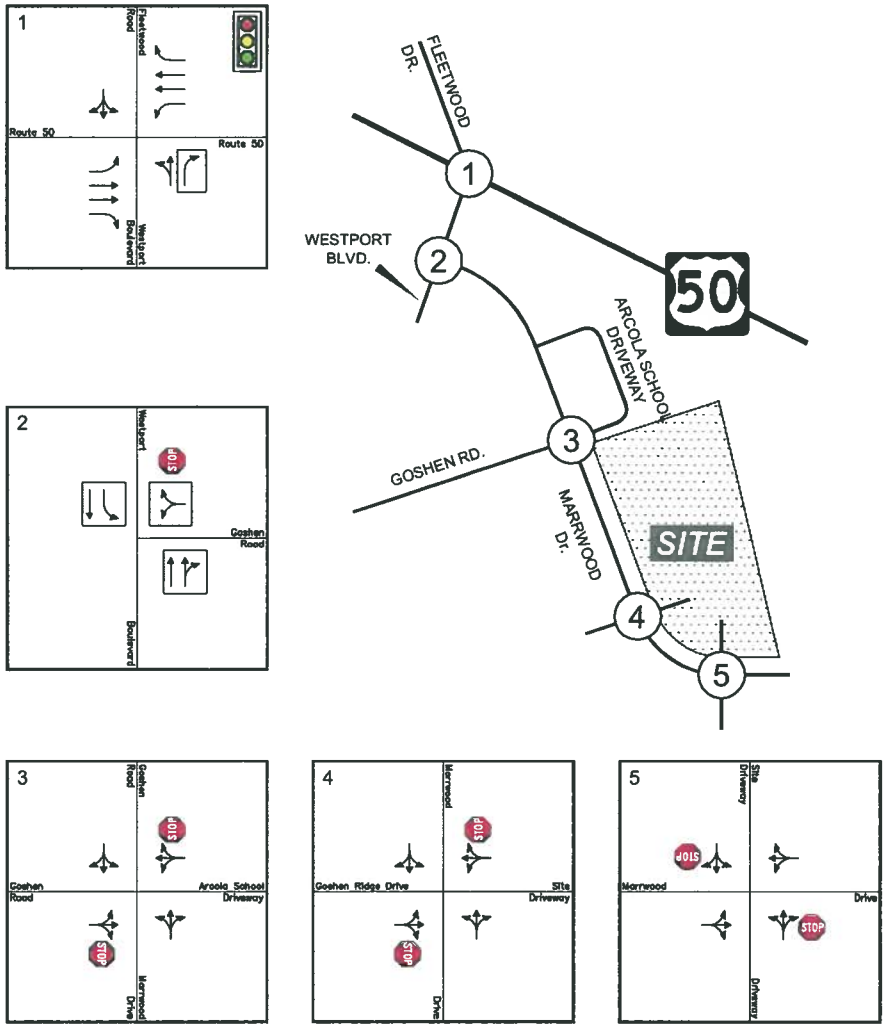


Figure 9–4
Future Lane Use and Traffic Control (Weekday)

Represents One Travel Lane
Signalized Intersection
Stop Sign
Improvements

North

Catholic Diocese of Arlington
Loudoun County, Virginia

ATTACHMENT 23

Wells + Associates, Inc.

Table T-1
Catholic Diocese of Arlington - Loudoun Property
Trip Generation Rate Comparison

Land Use	ITE Land Use Code	Size	Units		PM School Peak In	PM School Peak Out	PM School Peak Total	PM Commuter Peak In	PM Commuter Peak Out	PM Commuter Peak Total	Percent Difference (2)
Middle School	522	284	Students	Trips/Student	0.14	0.17	0.3	0.08	0.07	0.15	50%
				Trips	38	47	85	22	20	43	
High School	530	284	Students	Trips/Student	0.09	0.19	0.28	0.07	0.07	0.14	50%
				Trips	25	54	80	19	21	40	
The Langley School (1)	N/A	451	Students	Trips/Student	0.34	0.35	0.69	0.16	0.27	0.43	63%
				Trips	153	157	310	72	122	194	
Wakefield School (1)	N/A	491	Students	Trips/Student	0.23	0.32	0.55	0.09	0.18	0.26	48%
				Trips	111	159	270	42	87	129	
										Average	53%

Note:
(1) Based on counts conducted by Wells + Associates.
(2) Compares PM Commuter Peak *Total* to PM School Peak *Total*.